

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his)
capacity as ATTORNEY GENERAL)
OF THE STATE OF OKLAHOMA and)
OKLAHOMA SECRETARY OF THE)
ENVIRONMENT C. MILES TOLBERT,)
in his capacity as the)
TRUSTEE FOR NATURAL RESOURCES)
FOR THE STATE OF OKLAHOMA,)
)
Plaintiff,)
)
vs.) 4:05-CV-00329-TCK-SAJ
)
TYSON FOODS, INC., et al,)
)
Defendants.)

THE VIDEOTAPED DEPOSITION OF
BERTON FISHER, PhD, produced as a witness on
behalf of the Defendants in the above styled and
numbered cause, taken on the 23rd day of January,
2008, in the City of Tulsa, County of Tulsa, State
of Oklahoma, before me, Lisa A. Steinmeyer, a
Certified Shorthand Reporter, duly certified under
and by virtue of the laws of the State of Oklahoma.

A P P E A R A N C E S

FOR THE PLAINTIFFS:

Mr. David Page
Mr. Richard Garren
Attorneys at Law
502 West 6th Street
Tulsa, OK 74119
-and-

Mr. Louis Bullock
Attorney at Law
110 West 7th Street
Suite 707
Tulsa, OK 74119

FOR TYSON FOODS:

Mr. Robert George
Attorney at Law
The Three Sisters Bldg.
214 West Dickson Street
Fayetteville, AR 72701

FOR CARGILL:

Mr. John Tucker
Attorney at Law
100 West 5th Street
Suite 400
Tulsa, OK 74103

FOR SIMMONS FOODS:

Mr. John Elrod
Attorney at Law
211 East Dickson Street
Fayetteville, AR 72701
-and-
Ms. Vicki Bronson (via
phone)

FOR PETERSON FARMS:

Mr. Scott McDaniel
Mr. Craig Mirkes
Attorneys at Law
320 South Boston
Suite 700
Tulsa, OK 74103

TULSA FREELANCE REPORTERS
918-587-2878

1 FOR GEORGE'S:

Mr. Paul Thompson
Attorney at Law
221 North College
Fayetteville, AR 72701

4 FOR CAL-MAINE:

Mr. Robert Sanders
Attorney at Law
2000 AmSouth Plaza
P. O. Box 23059
Jackson, MS 39225

8 FOR WILLOW BROOK:

Ms. Jennifer Griffin
Attorney at Law
314 East High Street
Jefferson City, MO 65109
(Via phone)

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

TULSA FREELANCE REPORTERS
918-587-2878

I N D E X

W I T N E S S

P A G E

BERTON FISHER, PhD

Direct Examination by Mr. George	6
Direct Examination by Mr. McDaniel	204
Direct Examination by Mr. Elrod	283
Direct Examination by Mr. Tucker	303
Direct Examination by Mr. Sanders	320
Cross Examination by Mr. Page	324
Redirect Examination by Mr. George	326
Redirect Examination by Mr. McDaniel	327

Signature Page	332
----------------	-----

Reporter's Certificate	333
------------------------	-----

1 (Whereupon, the deposition began at
2 9:00 a.m.)

3 VIDEOGRAPHER: We are now on the Record for
4 the deposition of Dr. Bert Fisher. Today is January
5 23rd, 2008. The time is 9:00 a.m. Would counsel 09:00AM
6 please identify themselves for the Record?

7 MR. PAGE: David Page representing the
8 State of Oklahoma.

9 MR. GARREN: Richard Garren for the State
10 of Oklahoma. 09:00AM

11 MR. ELROD: John Elrod for defendant
12 Simmons.

13 MR. THOMPSON: Paul Thompson, Jr.,
14 defendant George's.

15 MR. McDANIEL: Scott McDaniel for Peterson 09:00AM
16 Farms, Inc.

17 MR. GEORGE: Robert George representing the
18 Tyson defendants.

19 MR. TUCKER: John Tucker for Cargill.

20 MR. MIRKES: Craig Mirkes for Peterson
21 Farms.

22 MR. SANDERS: Bob Sanders for the Cal-Maine
23 defendants.

24 MS. GRIFFIN: Jennifer Griffin representing
25 Willow Brook Foods. 09:00AM

TULSA FREELANCE REPORTERS
918-587-2878

1 VIDEOGRAPHER: Thank you. The witness may
2 be sworn in.

3 BERTON FISHER, PhD,
4 having first been duly sworn to testify the truth,
5 the whole truth and nothing but the truth, testified
6 as follows:

7 MR. PAGE: Robert, before we begin, can we
8 have an agreement that we'll reserve objections
9 except as to form?

10 MR. GEORGE: Certainly. 09:01AM

11 MR. PAGE: Thank you.

12 DIRECT EXAMINATION

13 BY MR. GEORGE:

14 Q Dr. Fisher, would you state your full name
15 please? 09:01AM

16 A John Berton Fisher.

17 Q Dr. Fisher, you understand you're here today
18 to give a deposition in connection with opinions
19 that you have put forward on behalf of the State of
20 Oklahoma in a case filed in the Northern District of 09:01AM
21 Oklahoma?

22 A Yes.

23 Q Okay. You've given a deposition before;
24 correct?

25 A I have. 09:01AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Dr. Fisher, in reviewing your CV, it appears
2 to me that you're a geologist. Would you agree with
3 that characterization?

4 A I would agree that I'm -- I have -- I'm a
5 geologist and a geochemist, that's correct. 09:01AM

6 Q Sir, are you a geomorphologist?

7 A No, but that's part and parcel of being a
8 geologist.

9 Q Have you had any particular training or do you
10 hold any specific certificates related to 09:02AM
11 geomorphology?

12 A I do not.

13 Q Are you a hydrologist, sir?

14 A Could you explain that? You mean a
15 hydrologist with respect to surface water flow 09:02AM
16 circumstances?

17 Q Let's start with that.

18 A Okay. Well, I would say that I have a
19 background in hydrology. I certainly know water
20 runs downhill. It's part and parcel of being a 09:02AM
21 geologist.

22 Q Well, with all due respect, I know water runs
23 downhill, too, but I wouldn't consider myself a
24 hydrologist. Do you consider yourself a
25 hydrologist? 09:02AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I think I need to know your term of
2 hydrologist.

3 Q Someone who has devoted a considerable portion
4 of his or her career to the study of the flow of
5 water over the surface. 09:02AM

6 A I'd say that I have substantial expertise in
7 hydrology.

8 Q Do you hold any particular advanced degrees or
9 certificates related to hydrology?

10 A I do not. 09:03AM

11 Q Sir, what is the difference between a
12 hydrologist and a hydrogeologist?

13 A Well, the discipline differences are generally
14 how they are trained, is that hydrologists in
15 general deal with surface water matters, and 09:03AM
16 hydrogeologists typically deal with groundwater
17 matters.

18 Q Do you believe that in your experience in your
19 professional life you have more expertise in one or
20 the other of those two groups? 09:03AM

21 A I believe that I have extensive experience in
22 hydrogeological matters and experience in
23 hydrogeology matters.

24 Q In reviewing your CV, it appears to me that to
25 the extent you worked on water matters, that most of 09:03AM

TULSA FREELANCE REPORTERS
918-587-2878

1 those matters have related to groundwater. Would
2 you agree with that?

3 A Yes, I would.

4 Q Okay. So as between hydro -- I'm sorry. As
5 between hydrology and hydrogeology, would you agree 09:03AM
6 your expertise is more in the area of hydrogeology?

7 A I would say that I have substantial experience
8 in hydrology and a very substantial experience in
9 hydrogeology.

10 Q Sir, do you consider yourself a 09:04AM
11 microbiologist?

12 A No.

13 Q What is a microbiologist?

14 A Well, a microbiologist is, first of all, a
15 biologist. A microbiologist is someone who studies 09:04AM
16 things that are very small and alive. So it would
17 be a broad category of organisms, including

18 bacteria, some fungi, viruses, bacteriophages,
19 prions, all sorts of small things. Now, I'm not a
20 microbiologist. A geochemist -- most geochemical 09:04AM

21 processes or many geochemical processes are driven
22 by microbiologic forces and to the extent that I
23 understand microbial processes that drive
24 geochemical events, I have that expertise in
25 microbiology. 09:04AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q I understand from reviewing the affidavit that
2 you submitted in this case, that one of the areas in
3 which you've been asked to comment and provide
4 analysis is in regard to fate and transport; is that
5 correct? 09:05AM

6 A That is correct.

7 Q Okay. What substances, sir, whether they be
8 chemical or microbial, have you evaluated in your
9 prior professional experience regarding the capacity
10 of those substances to move through soils in the 09:05AM
11 underground water?

12 A A broad range of materials. Let's just start
13 with --

14 MS. BRONSON: Vicki Bronson.

15 A -- crude oil, dissolved constituents of crude 09:05AM
16 oil, soluble salts, including, as I recall, in the
17 City of Tulsa case, phosphorus and its various
18 chemical forms, and the movement of particles in
19 general, and particles would certainly include
20 bacteria. 09:05AM

21 Q Sir, have you ever worked on a case prior to
22 your involvement in this lawsuit in which the
23 material that you were evaluating in terms of
24 movement, whether it be surface or subsurface, was
25 bacteria? 09:06AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Well, any time you deal with particle
2 transport in the natural setting, you're dealing
3 with bacterial transport.

4 Q Well, let me refine my question. Dr. Fisher,
5 have you ever offered an opinion before in a case 09:06AM
6 regarding the transport of bacteria as opposed to
7 just particles generally?

8 MR. PAGE: Object to the form.

9 A I don't believe I've offered any specific
10 opinion with respect to the transport of bacteria, 09:06AM
11 except that bacteria moves particles in the
12 environment and are frequently found two particles.

13 Q Sir, can you identify for me the cases that
14 you've worked on in litigated matters where the
15 constituent of concern was bacteria? 09:07AM

16 A There are no such cases.

17 Q Okay. This would be your first bacteria case;
18 is that correct?

19 A Well, there are no cases that were in
20 litigation that involved bacteria. 09:07AM

21 Q What about research projects, whether it be
22 for industry or in academia; have you ever conducted
23 a research project that specifically evaluated the
24 movement of bacteria in either surface water or
25 groundwater? 09:07AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I've worked on research projects in industry
2 and in academia that have involved the microbial
3 processing of materials in surface water,
4 groundwater and soils.

5 Q I think you answered a different question than 09:07AM
6 I asked perhaps, sir. Have you ever worked on a
7 research project or published a paper that related
8 to the evaluation of the movement of bacteria in
9 either surface water or groundwater?

10 A No. 09:08AM

11 Q Do you agree with me, sir, that there are
12 differences in the way in which different
13 substances, chemicals or microbes, migrate through
14 the soil and have the potential to impact
15 groundwater? 09:08AM

16 A I think you've just asked a compound question
17 and don't recognize that.

18 Q Well, answer the first part first and then
19 we'll go to the second part.

20 A Okay. Could you rephrase your question? 09:08AM

21 Q Do you agree with me, sir, that there are
22 differences in the manners and mechanisms in which
23 different substances, such as chemicals, microbes or
24 dissolved substances, travel through soils and
25 penetrate groundwater? 09:09AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Okay, and specifically referring to
2 mechanisms?

3 Q Yes, sir.

4 A I think that requires some explanation. The
5 mechanisms of transport would be bulk flow, 09:09AM
6 advection, that is, the movement with the moving
7 fluid, and so that would -- as materials are
8 dissolved in a fluid, they'll move with the fluid.

9 If materials are suspended in a fluid, they will
10 move with the fluid. So advectively, no. With 09:09AM
11 respect to diffusion, which is the movement of
12 materials due to chemical potential differences,
13 that is, differences in concentration, even very,
14 very small solid particles will diffuse, infused to
15 brining motion, as will dissolved particles. So as 09:10AM
16 to mechanism, no, the mechanisms are equivalent.

17 Q Are you familiar with the mechanism known as
18 filtration?

19 A I'm aware of filtration.

20 Q What is filtration? 09:10AM

21 A Well, filtration is the physical removal of a
22 material from a solution, so much as you would have
23 a coffee filter, for example.

24 Q And is it true that at a general level that
25 soil often acts as a filter in filtering out 09:10AM

TULSA FREELANCE REPORTERS
918-587-2878

1 constituents as they travel through the soil profile
2 and down towards groundwater?

3 A Well, if you're assuming that the soil is a
4 continuous medium and you're assuming that the soil
5 doesn't have large voids in it, then it can act as a
6 filter, but it's not necessarily uniformly always
7 acting as a filter.

09:10AM

8 Q You'll agree there are soils in the Illinois
9 River watershed that are capable of filtering
10 bacteria as it moves through the soil profile;
11 correct?

09:11AM

12 A There's certainly soils that can filter
13 materials as it moves through the soil profile. The
14 issue is not whether the soils can filter the
15 material but whether or not the soil is continuous
16 enough and not broken such that it's effective
17 everywhere.

09:11AM

18 Q Is it effective in some places as a filter?

19 A It may be.

20 Q Okay. Could you identify those places for me
21 where you believe the soil is of a sufficient
22 quality in the Illinois River watershed that it
23 filters substantially bacteria before it reaches
24 groundwater?

09:11AM

25 A No.

09:11AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Why can you not identify that?

2 A Well, I would say that because of the nature
3 of the underlying bedrock and the distribution of
4 soil cover within the Illinois River watershed, that
5 there are numerous fractures and faults that have 09:12AM
6 been expanded by dissolution of the carbonate rocks
7 that make up the underlying geology, that permit
8 direct downward movement of materials, including
9 bacteria, into the subsurface, and that there are
10 numerous scientific studies that were included in my 09:12AM
11 production that clearly show that's true, in
12 addition to the sampling data that was provided to
13 the defendants.

14 Q But I believe, Dr. Fisher, make sure we still
15 have a point of agreement, but I think your answer 09:12AM
16 was a little different than what I had understood
17 before. You do agree with me that there are areas
18 in the Illinois River watershed where the soils are
19 adequate filters for bacteria?

20 MR. PAGE: Object to the form. 09:12AM

21 A There may be.

22 Q Okay. You just have not identified those
23 specific areas; is that fair?

24 A I have not and to my knowledge, no one has.

25 Q All right. Were you asked to identify those 09:12AM

TULSA FREELANCE REPORTERS
918-587-2878

1 areas?

2 A No. I was asked -- well, let's go on with
3 your question.

4 Q No, you were not asked?

5 A I was not asked to specifically identify areas 09:13AM
6 that were permeable or areas that were impermeable.

7 Q Going back to the concept of filtration that
8 we've been discussing, Dr. Fisher, do you agree with
9 me that the filtration rate for bacteria is
10 different than the filtration rate for dissolved 09:13AM
11 chemicals?

12 A Could you define filtration rate?

13 Q I thought we had just discussed this process
14 of removing of bacteria or particles from water as
15 it travels through the soil profile and towards the 09:13AM
16 groundwater.

17 MR. PAGE: Object to the form.

18 A Okay. Your prior question had to do with the
19 mechanism of filtration.

20 Q Okay. As a geologist, can you calculate 09:13AM
21 filtration rates based on soil types and the
22 particular constituent of concern?

23 A You mean whether -- well, okay. Filtration
24 rate I think is an ambiguous term, as that would be
25 the rate of removal, the time rate of removal of 09:13AM

TULSA FREELANCE REPORTERS
918-587-2878

1 materials, and so that has -- that is dependent upon
2 a lot of factors.

3 Q Okay, but as just -- as a general matter, are
4 there differences in filtration rates depending upon
5 the constituent of concern? 09:14AM

6 MR. PAGE: Object to the form.

7 A Mr. George, if you insist on using the term
8 filtration rate, we're not -- we're going to be here
9 a real long time.

10 Q I think you just defined what my working
11 definition of filtration rate is so --

12 MR. PAGE: Object to the form.

13 A I'm not sure I know what your definition of
14 filtration is. I don't mean to be argumentative.

15 Q Let's clean it up and -- because I do want to
16 communicate with you very clearly, Dr. Fisher, and
17 I'm not trying to use terms that are beyond your
18 comprehension or that are misleading in any way. So
19 let's stop for a moment and define filtration rate.

20 Okay? A filtration rate, according to the 09:14AM
21 definition you provided me just a moment ago, is the
22 rate of reduction of a particular constituent over
23 time as it moves through the soil profile for
24 groundwater.

25 MR. PAGE: Object to the form. 09:14AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Do you understand that term?

2 A I understand how you characterized my
3 testimony, but as I recall, that was not my
4 testimony.

5 Q Do you have any objection to the definition 09:15AM
6 that I just provided for filtration rate?

7 A Could you resupply that definition?

8 MR. GEORGE: Could you read it back,
9 please?

10 (Whereupon, the court reporter read 09:15AM
11 back the previous question at Page 17, Line 20
12 through Page 18, Line 1.)

13 A Well, you really are confounding a number of
14 things. First, you have -- you want to take -- do
15 you want to consider the rate of removal as a 09:15AM
16 function of time through a surface? That's one
17 issue. The other issue would be attenuation, that
18 is, would be the rate of diminution in a component
19 over a path life, which may or may not have a strong
20 time dependency. Rate implies time dependency. 09:16AM
21 Which question would you like me to answer?

22 Q I think my question was filtration rate. Let
23 me ask my question again with that definition, and
24 we'll get to attenuation because you mentioned
25 attenuation in your affidavit, but the basic 09:16AM

TULSA FREELANCE REPORTERS
918-587-2878

1 question I have, Dr. Fisher, is whether you agree
2 with me that there are differences in filtration
3 rates as between bacteria and dissolved chemicals?

4 A Maybe I can cut through your question because
5 I think it's really ill posed. 09:16AM

6 Q I'd rather you answer it.

7 A Well, I'm sure you would rather I would answer
8 your question, but the question is imprecise. There
9 would be a difference in removal, say in removal
10 efficiencies, between dissolved constituents and 09:16AM
11 particulate constituents moving through a porous
12 medium. That would be an accurate statement.

13 Q Okay. What about attenuation; are there
14 differences in the rate of attenuation as between
15 dissolved chemicals and bacteria? 09:17AM

16 A Okay, and, again, objecting to the term rate,
17 with respect to attenuation, there are differences
18 in attenuation between particulates and dissolved
19 materials moving through a porous medium. I would
20 hasten to add that there is no difference in 09:17AM
21 attenuation or in filtration of particles or
22 dissolved constituents moving through large cracks,
23 fractures and crevices.

24 Q Okay. Is it your testimony, sir, that every
25 field in the Illinois River watershed contains large 09:17AM

TULSA FREELANCE REPORTERS
918-587-2878

1 cracks and crevices?

2 A It would be my testimony that based upon
3 review of geological data, that every field within
4 the Illinois River watershed is near to, is
5 physically near a crack or a crevice or a fracture.

09:18AM

6 Q How near?

7 A Pardon?

8 Q How near?

9 A I've not done that computation.

10 Q Well, what did you mean by near?

09:18AM

11 A Near, that is that drainage in most fields
12 will ultimately intercept fractures, cracks and
13 crevices.

14 Q Are you referring to surface drainage?

15 A Yes, surface drainage as well as infiltration
16 drainage.

09:18AM

17 Q Okay, but if there's not a crack or crevice
18 underneath the field in terms of infiltration, that
19 would be more -- an important distinction in
20 evaluating the risk of groundwater contamination of
21 that field compared to one that had a crack or
22 crevice; correct?

09:18AM

23 MR. PAGE: Object to the form.

24 A It would be part of the consideration.

25 Q Have you done that sort of field-by-field

09:18AM

TULSA FREELANCE REPORTERS
918-587-2878

1 analysis in connection with your work in this case?

2 A I have not.

3 Q Why not?

4 A It's a large watershed. I was not asked to

5 look at it on a field-by-field basis. 09:18AM

6 Q Sir, do you have any particular expertise in

7 assessing the survivability or die-off of bacteria

8 after it is applied to a field and while it moves

9 either across the surface or through the surface?

10 A No. I think other experts in this case would 09:19AM

11 have that expertise.

12 Q Okay. Have you consulted with an expert who

13 you rely upon in terms of their opinion regarding

14 the die-off of bacteria?

15 A Yes. 09:19AM

16 Q And who is that expert?

17 A Okay. Well, for our own experts they would be

18 Valeria Harwood, and experiments conducted by Ralph

19 Davis at the University of Arkansas indicate that

20 there's substantial bacterial survivability in the 09:19AM

21 environment, both in sediments as well as in fields

22 as I recall, and there is scientific literature to

23 that effect as well, but I don't -- it's not my

24 intention to offer an opinion concerning bacterial

25 survivability. 09:20AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. When you said there is substantial
2 survivability, what -- give me some perspective of
3 what you're talking about.

4 A That is, there is still viable organisms
5 multiple months after discharge into the environment 09:20AM
6 from fecal sources.

7 Q Several months?

8 A At least.

9 Q Okay. What about in terms of the population
10 of those organisms; did you from either reviewing 09:20AM
11 the work of the University of Arkansas professor or
12 talking to Miss Harwood, did you arrive at any
13 understanding as to the rate of reduction in terms
14 of living organisms over time?

15 A There is a rate of reduction. I don't recall 09:20AM
16 what it is.

17 Q Okay. Did you take that rate of reduction
18 into account in your work in this case in any way?

19 A Well, from the -- in the fact that
20 fecal-sourced bacteria are found in shallow 09:20AM
21 groundwater within the basin, they clearly survive
22 long enough to get there.

23 Q You are familiar with the term reactivity as
24 it relates to certain chemicals or substances?

25 A I'm familiar with the term reactivity. 09:21AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. What's your working definition of
2 reactivity?

3 A Reactivity would be the tendency for two or
4 more substances to interact in a chemical reaction.

5 Q Can reactivity affect the transport of 09:21AM
6 substances through a medium such as a soil or over
7 the surface of soil?

8 A Yes.

9 Q How so?

10 A In the case -- well, let's look at an 09:21AM
11 interesting case. Let's look at the case of
12 arsenic, for example, which is present in poultry
13 wastes. Arsenic has a chemistry that's very similar
14 to phosphorus, and both phosphorus and arsenic will
15 interact with exchange sites on clays and in oxide 09:21AM
16 coatings on soils to become more particle
17 associated. They aren't permanently particle
18 associated.

19 Because there's so much phosphorus present in
20 this particular system, it would basically swamp the 09:22AM
21 ability of that system to retain arsenic and
22 conceivably force it outward. It would be
23 equivalent to putting a very salty solution through
24 a sand body that contained radium. The radium would
25 be largely present initially as an exchange cation 09:22AM

TULSA FREELANCE REPORTERS
918-587-2878

1 on exchange surfaces. Putting a salt brine into
2 that would displace the radium into the solution.

3 Q Does bacteria react in that same sense with
4 anything else in the environment that would affect
5 its transport? 09:22AM

6 A In a chemical sense, bacteria have -- as a
7 geochemist, I can speak about this. We do know that
8 bacteria form -- will interact with particles in
9 numerous ways. That would include chemical

10 interactions, electrostatic interactions, as well as 09:23AM
11 biological-type interactions. Bacteria tend to be
12 associated with fine particles in the environment,
13 particularly tend to be associated with surfaces.

14 Q Okay. Sir, is it your understanding that you
15 would not find bacteria free in the water column 09:23AM
16 unattached to a particle?

17 A No, no. The bacteria will be largely attached
18 to surfaces, but they can be sheared from those
19 surfaces and displaced into the water column.

20 Q What is sorption? 09:23AM

21 A Well, what -- sorption is an interaction
22 between a material in solution or suspension, if you
23 will.

24 (Whereupon, a discussion was held off
25 the Record.) 09:26AM

TULSA FREELANCE REPORTERS
918-587-2878

1 VIDEOGRAPHER: We are back on the Record.

2 The time is 9:26 a.m.

3 Q Dr. Ol -- I'm sorry, Dr. Fisher, I believe you
4 were giving me your definition of sorption.

5 A Right. As it would generally be thought of, 09:26AM
6 sorption is an interaction between a material in
7 solution or material -- well, generally by material
8 in solution in a fluid phase or -- material in a
9 fluid phase. It could be in a gas, could be in a
10 liquid and a solid phase. 09:26AM

11 Q Have you evaluated the sorption capacity, if
12 you will, of bacteria as part of your work in this
13 case?

14 A I have not.

15 Q According to your CV, Dr. Fisher, you are the 09:27AM
16 president of a company called Lithochimeia; is that
17 correct?

18 A That's correct.

19 Q What is Lithochimeia?

20 A Lithochimeia is a geoscience consulting 09:27AM
21 company.

22 Q How big of a company in terms of the number of
23 principals?

24 A Small. There are two principals.

25 Q Who is the other principal? 09:27AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Robert L. Hight.

2 Q How do you spell his last name?

3 A H-I-G-H-T.

4 Q What professional discipline or background is

5 Mr. Hight?

09:27AM

6 A Mr. Hight, by experience -- I think he's

7 actually an English major, but by experience he is

8 an expert in data management and geographic

9 information systems.

10 Q And how long have you been a principal in or

09:27AM

11 affiliated with Lithochimeia?

12 A Four -- well, this is our fourth year.

13 Q Okay. Are you one of the founders?

14 A Yes.

15 Q And what type of work does Lithochimeia do?

09:28AM

16 A Lithochimeia does environmental geosciences

17 work, primarily be involved with examining pollution

18 matters, especially as they would relate to

19 geochemical things, salt pollution, oil pollution,

20 fate and transport of materials in general in the

09:28AM

21 environment from agricultural activities or

22 industrial activities.

23 Q And prior to founding Lithochimeia, you were

24 employed by Exponent; is that correct?

25 A That is correct.

09:28AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Can you explain to me the circumstances that
2 led to your severing your relationship with
3 Exponent?

4 A Certainly. At that time in 2004 there was an
5 opportunity to do two things. One was to join the 09:29AM
6 faculty at the University of Tulsa, which I did,
7 and, two, was to form my own company and work on --
8 for myself. So I gained enough experience working
9 for Exponent in prior things to feel comfortable
10 doing that. 09:29AM

11 Q Who would have been your boss or supervisor at
12 Exponent?

13 A Oh, well, let's see. At the end of my tenure
14 there I reported to Paul Boehm, B-O-E-H-M.

15 Q Now, you mentioned that you left Exponent to, 09:29AM
16 in part, assume some teaching responsibilities at
17 the University of Tulsa; correct?

18 A That's correct.

19 Q Okay. What courses did you teach at the
20 University of Tulsa? 09:29AM

21 A I taught physical geology, environmental
22 geochemistry, geochemistry, petroleum geology and a
23 freshman geosciences seminar.

24 Q Do you still have teaching responsibilities at
25 the University of Tulsa? 09:30AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I do not.

2 Q Okay. When did you cease your teaching
3 responsibilities?

4 A I tendered my resignation last spring,
5 effective in August of 2007. 09:30AM

6 Q Why did you decide to stop teaching at the
7 university?

8 A You only have seven hours. No. The
9 university job and having a private consulting
10 business were burning a two-ended candle at three 09:30AM
11 ends and, as a consequence, to maintain some sanity
12 and my health, I needed to stop doing something.

13 Q Dr. Fisher, according to the affidavit that
14 you provided in this case, you've been asked to
15 evaluate fate and transport issues as we discussed. 09:31AM
16 Are you aware that there are some other experts
17 involved in this case that the attorney general has
18 also asked to evaluate fate and transport?

19 A Not directly aware but I wouldn't be surprised
20 at all if there are others with those
21 qualifications.

22 Q Have you worked with a gentleman named Roger
23 Olsen in this case?

24 A I have.

25 Q Is it your understanding or do you have an 09:31AM

TULSA FREELANCE REPORTERS
918-587-2878

1 understanding as to whether Mr. Olsen is evaluating
2 fate and transport issues?

3 A He is.

4 Q Okay. What about Mr. -- Dr. Engel; are you
5 familiar with Dr. Engel?

09:31AM

6 A Yes, I am.

7 Q Okay. Do you understand that he also has been
8 asked to evaluate fate and transport issues?

9 A I don't know all the charges that Dr. Engel
10 has, but it's likely that he's done it. He's done
11 work like that in the past. He may well be doing
12 that.

09:31AM

13 Q As someone who has been part of the working
14 relationship, and I haven't had the benefit of that
15 obviously, help me understand the differences in the
16 areas in which you've been asked to concentrate as
17 compared to your colleagues, Drs. Olsen and Engel?

09:31AM

18 A Well, I guess it would be that I would have
19 more of geological interpretations to make, although
20 we have overlapping levels of expertise between
21 myself and Dr. Olsen, and with respect to Dr. Engel,
22 we sort of have the boots on the ground in here, and
23 he manages and directs some of the efforts of my
24 company.

09:32AM

25 Q Dr. Engel manages and directs?

09:32AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A No, not manages. He would direct me to do a
2 certain task and then provide guidance as to how
3 that task might need to be conducted.

4 Q Give me some examples of tasks that Dr. Engel
5 has asked you to complete. 09:32AM

6 A Well, probably the largest task had to do with
7 doing -- assisting him in doing a computation of
8 waste generation from poultry operations within the
9 Illinois River watershed. That would be one task.
10 Another task would be reviewing and analyzing the 09:33AM
11 records concerning poultry waste disposal that are
12 maintained by the Oklahoma Department of
13 Agriculture, Food & Forestry.

14 Q Dr. Fisher, were you asked to evaluate or
15 compute the amount of waste for any source other 09:33AM
16 than poultry litter?

17 A Was I asked -- not personally, no.

18 Q Did someone ask you impersonally?

19 A That's an interesting question. No, I did not
20 execute such a computation. 09:34AM

21 Q Well, were you asked to execute such a
22 computation?

23 A Such computations were executed but not by me.

24 Q Okay. Who computed the amount of waste from
25 sources other than poultry litter? 09:34AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A As I recall, that was done by Alexander
2 Consulting.

3 Q Who is Alexander Consulting?

4 MR. PAGE: I'm going to object at this
5 point, Robert. We're going beyond the course of the 09:34AM
6 preliminary injunction, into the area of the main
7 case. We had a similar discussion I think with Dr.
8 Engel, and so I would ask you to rephrase your
9 question and limit it to the opinions that Dr.
10 Fisher has provided and the opinions that are being 09:34AM
11 provided and the issues provided for the preliminary
12 injunction.

13 MR. GEORGE: David, I think the work that's
14 been described, if I understand it correctly, is
15 indeed germane to the issues before the PI to the 09:34AM
16 extent there is an attempt to characterize the
17 magnitude of poultry litter in this case. Another
18 relevant part of that analysis is how does that
19 compare with other sources of bacteria in the
20 watershed. This witness has identified some work 09:35AM
21 along those lines that has not been provided to the
22 defendants, and I intend at the end of this
23 deposition to ask for its production. So at this
24 point, either you can allow me to go forward or the
25 State can assert its position as to why it's not 09:35AM

TULSA FREELANCE REPORTERS
918-587-2878

1 willing to.

2 MR. PAGE: Well, my concern is that Dr.
3 Fisher is not the one that's done this work, and
4 contrary to your statement, there have been
5 calculations of waste production from other sources
6 provided.

09:35AM

7 MR. GEORGE: In whose materials?

8 MR. PAGE: Dr. Teaf comes to mind
9 immediately.

10 MR. GEORGE: You believe Dr. Teaf's
11 materials include computations as to the amount of
12 waste, say, for example, generated by cattle?

09:35AM

13 MR. PAGE: Yes. So that --

14 MR. GEORGE: It sounds to me that in light
15 of that, that you agree it's relevant to the PI or
16 it wouldn't have been produced in whatever expert's
17 materials, and at this junction I'm simply exploring
18 this witness' knowledge of that work.

09:36AM

19 MR. PAGE: Fair enough. You can explore,
20 but I think he's already testified that he did not
21 do the work, but go ahead. You can identify his
22 competence.

09:36AM

23 Q Dr. Fisher, after that exchange with lawyers,
24 you may have forgotten my question. Do you recall
25 it?

09:36AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I do not.

2 Q Okay. You identified Alexander Consulting as
3 one of the groups that have perhaps performed
4 computation of waste from other sources, non-poultry
5 sources; correct? 09:36AM

6 A Yes.

7 Q Okay, and I asked who is Alexander Consulting?

8 A Alexander Consulting is a local environmental
9 consulting company.

10 Q Have you seen the actual work product from 09:36AM
11 Alexander Consulting that is a result of these
12 computations?

13 MR. PAGE: Object to the form.

14 A I think I've seen drafts of the work product.

15 Q What do you recall about the magnitude of 09:37AM
16 other non-poultry sources of waste?

17 A Boy, the computations were in terms of -- they
18 really aren't so relevant to this, but they were
19 looking at other materials. They were not looking
20 at total masses as I recall. They were looking at 09:37AM
21 chemical constituents, contributions to various
22 chemicals, so not directly at masses.

23 Q Well, was -- has someone quantified the amount
24 of cattle manure in the watershed to your knowledge?

25 A I believe that has been quantified in some 09:37AM

TULSA FREELANCE REPORTERS
918-587-2878

1 way, yeah.

2 Q Do you understand, sir, that cattle manure
3 contains bacteria?

4 A Well, I would understand that all manure
5 that's not been appropriately composted or treated 09:38AM
6 would contain some bacteria, sure.

7 Q Okay. So you agree with me cattle manure
8 contains bacteria?

9 A There would be no dispute.

10 Q Okay. Do you recall what the result of the 09:38AM
11 computation was in terms of how much cattle manure?

12 MR. PAGE: Object to the form.

13 A I do not.

14 Q Do you recall if it was greater than the
15 amount Dr. Engel quantifies for poultry litter? 09:38AM

16 A I do not and, again, Mr. George, the
17 computations were done with respect to chemical
18 constituencies and not in terms of total masses, at
19 least the computation drafts that I've seen.

20 Q Okay. So you recall seeing a computation as 09:38AM
21 to, for example, how much phosphorus may be excreted
22 by cattle?

23 A Yes.

24 Q Okay. As opposed to the total amount of
25 manure in volume? 09:38AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A That's correct.

2 Q Okay, and do you recall whether there was a
3 computation as to the amount of bacteria excreted by
4 cattle?

5 A That would have been done by someone other 09:39AM
6 than Alexander Consulting. That's my belief. I'm
7 not necessarily knowledgeable in everything that
8 happens.

9 Q Has someone else to your knowledge performed
10 that calculation? 09:39AM

11 A I don't know.

12 Q Dr. Fisher, who hired you in this case?

13 A My contract is with Motley Rice, but I'm
14 approved by the attorney general to work on the
15 case. So I guess, in essence, I'm hired by the 09:39AM
16 attorney general.

17 Q Who's been giving you direction, the attorney
18 general or one of the lawyers?

19 A The attorney general's office has provided
20 direction. 09:39AM

21 Q Who have you worked with directly in the
22 attorney general's office?

23 A Kelly Burch.

24 Q Who actually paid your invoices?

25 A Motley Rice. 09:40AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q How much have you been paid for your work on
2 this case, Dr. Fisher?

3 A I didn't come here today with that number in
4 mind. So I don't specifically know how much I
5 personally have been paid. 09:40AM

6 Q Okay. Have you been paid more than \$100,000?

7 A Yes.

8 Q Okay. How long ago were you retained?

9 A I would have been retained in 2004, late '04.

10 Q Okay, and have you been working fairly 09:40AM
11 consistently on this case since late 2004?

12 A Could you define consistently?

13 Q Well, have you devoted at least part of every
14 month since 2004 to your work on this case?

15 A Yes. 09:41AM

16 Q Okay. In a given week, how many hours would
17 you estimate that you spend on this case as opposed
18 to other matters?

19 A That's so variable, I can't tell you offhand.

20 Q You said you've been paid at least a hundred 09:41AM
21 thousand. Have you been paid more than 500,000?

22 A Okay. When you say you, what do you mean by
23 you?

24 Q I'm sorry. Lithochimeia?

25 A I mean when you mean paid, do you mean paid 09:41AM

TULSA FREELANCE REPORTERS
918-587-2878

1 for services rendered or do you mean monies
2 transferred even though they might be for expenses?

3 Q Let's include both expenses and services
4 rendered.

5 A And then your question was? I'm sorry. 09:41AM

6 Q It's okay. Have you been paid more than
7 \$500,000 for your work in this case?

8 A Yes.

9 Q Now, this is not your first poultry case, is
10 it? 09:42AM

11 A No.

12 Q Okay. Tell me what other poultry matters
13 you've worked on.

14 A I've worked on the case that's generally known
15 as Tulsa v. Tyson, et al, on behalf of the Tulsa 09:42AM
16 Metropolitan Utilities Authority, not during the
17 actual trial or run up to trial, but afterwards.

18 Q You offered testimony, as I recall, in that
19 case in connection with the disputed settlement
20 terms referred to as the phosphorus index; is that 09:42AM
21 what you recall?

22 A That's correct.

23 Q And in that case you testified in favor of the
24 plaintiff and against the poultry industry; is that
25 correct? 09:42AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I testified as a witness called by the
2 plaintiff.

3 Q Now, in your affidavit -- we might as well go
4 ahead and attach it since we've referenced it a time
5 or two. Let me hand you what we've marked as 09:43AM
6 Exhibit 1 to your deposition.

7 MR. PAGE: Thank you.

8 Q And ask you if you can identify that, Dr.
9 Fisher, as a copy of the affidavit that you have
10 submitted setting forth your opinions in connection 09:43AM
11 with the preliminary injunction motion.

12 A It is.

13 Q If you'll turn to Page 3, it's the very bottom
14 portion of the first paragraph. It's a long
15 paragraph, and on Page 3 of your affidavit, sir, you 09:43AM
16 state that you've worked on environmental matters
17 relating to poultry waste since 1997; correct?

18 A That's correct.

19 Q The City of Tulsa testimony that you were
20 referring to would have occurred in 2004. What 09:44AM
21 matters were you working on in 1997 related to
22 poultry?

23 A In 1997 I was asked by Patsy Bragg, who at
24 that time was a member of the Tulsa Metropolitan
25 Utilities Authority, to assist her in beginning the 09:44AM

TULSA FREELANCE REPORTERS
918-587-2878

1 process, her process and the process of the Tulsa
2 Metropolitan Utilities Authority to understand
3 technical issues surrounding water pollution issues
4 and eutrophication issues in Lakes Eucha and
5 Spavinaw and within the Spavinaw Creek drainage, and 09:44AM
6 so in the course of that, I assisted the Utility
7 Authority in numerous meetings, both of the
8 Authority, also meeting with outside experts,
9 helping coordinate some of the technical activities
10 that were being conducted up until trial. So there 09:45AM
11 is a hiatus in there.

12 Q Dr. Fisher, in 1997 when you were working with
13 Patsy Bragg, were you specifically evaluating
14 environmental contamination by poultry waste?

15 A Well, I was looking at environmental 09:45AM
16 contamination from agriculture, poultry waste was
17 the focus.

18 Q Okay. Other than your presuit work with Patsy
19 Bragg and your testimony in the City of Tulsa case
20 after the case had settled, what other poultry waste 09:45AM
21 matters have you worked on professionally?

22 A I've looked at -- now, this has not been in
23 litigation. It was potential litigation. I can't
24 think of -- it was Russell Dilday was the client.
25 There's an overflow of a liquid waste lagoon from I 09:45AM

TULSA FREELANCE REPORTERS
918-587-2878

1 think it was Minehart Eggplant, and went down to
2 evaluate the impact on his property from that
3 overflow and potential long-term chronic leakage
4 from the lagoons.

5 Q Dr. Fisher, any other poultry litter matters, 09:46AM
6 whether litigated or not, that you've worked on or
7 you recall working on?

8 A No.

9 Q Are you familiar with the case that involves
10 some of these same companies that's referred to as 09:46AM
11 the Grand Lake litigation?

12 A Yes.

13 Q Were you involved in the Grand Lake
14 litigation?

15 A Grand Lake litigation -- I think I talked with 09:46AM
16 Mr. Shipley about the Grand Lake litigation at one
17 time, and I believe there was a time when I was at
18 Exponent that Mr. Hight did some mapping on behalf
19 of Peterson Farms in that litigation but that was
20 fairly limited involvement. 09:47AM

21 Q Dr. Fisher, were you involved at all in the
22 work that Mr. Hight completed on behalf of Peterson
23 Farms while you and he were principals at Exponent?

24 A Well, we were not principals at Exponent.

25 Q While you were both employed at Exponent? 09:47AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I was a principal at Exponent. Was I
2 involved? Well, I think aside from picking up data
3 from Mr. McDaniel's office and carrying it over to
4 Mr. Hight, no, is my recollection.

5 Q Now, Mr. Hight is also a principal in your 09:47AM
6 current company through which you are providing
7 consulting services in this case; correct?

8 A That's correct.

9 Q And you do agree that Mr. Hight previously
10 performed professional services for Peterson Farms 09:47AM
11 in connection with the Grand Lake case; is that
12 correct?

13 A I would say that Mr. Hight put points on a
14 map.

15 Q You don't consider that to be a professional 09:47AM
16 service?

17 A I consider it being a technician service at
18 that time.

19 Q Okay.

20 A It would be like saying he took pictures for 09:48AM
21 him.

22 Q Have you and Mr. Hight talked about whether
23 Lithochimeia has a conflict given its prior work in
24 the Grand Lake case?

25 A Yes. 09:48AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q What have you concluded?

2 A We've concluded the -- and I've discussed this
3 with our attorneys as well. The nature of the
4 engagement while at Exponent was such that it was
5 not material. 09:48AM

6 Q What does it take to be material? Help me
7 understand that.

8 MR. PAGE: Object to the form.

9 A Well, my interpretation would have been to
10 assist in development of technical approaches to the 09:48AM
11 case, not simply acting in a service provider role,
12 and also in the service provider role, it would be
13 material if we had had any significant access to
14 documents that the current defendant might have had
15 with respect to their business practices and so on. 09:49AM
16 We did not.

17 Q You reviewed your records from that case and
18 determined that you didn't have access to any
19 documents from Peterson Farms or the other
20 defendants? 09:49AM

21 MR. PAGE: Object to the form.

22 Q Is that your testimony?

23 A No. What I'm saying -- that is not my
24 testimony. My testimony is that the size of the job
25 was small. The documents that were received -- I 09:49AM

TULSA FREELANCE REPORTERS
918-587-2878

1 think the documents we received were really data
2 items or data files, electronic data files from GPS
3 work locating poultry houses within the Grand Lake
4 watershed. So no documents as to company processes
5 or procedures or where the company may have disposed 09:50AM
6 of waste or how they disposed of waste, nothing that
7 was material, and it's in a different watershed, and
8 it's just small; it was just a small deal.

9 Q As part of your work in this case, you've also
10 located poultry houses within a watershed; is that 09:50AM
11 correct?

12 A Yes, I have.

13 Q Okay. So there's some similarities in the
14 type of work that was done in the two cases by Mr.
15 Hight in the first instance and yourself in this 09:50AM
16 instance; is that correct?

17 A I would say that it's incredibly dissimilar.

18 Q Because of the size?

19 A The size, the scope, the extent, the nature of
20 the data collection. 09:50AM

21 Q How much money would Peterson have had to have
22 paid you in that prior case for it to have been a
23 conflict for you in this case?

24 MR. PAGE: Object to the form.

25 A It wouldn't -- as I testified -- 09:50AM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: That's argumentative.

2 A Well --

3 MR. GEORGE: He's indicated the size of the
4 matter is relevant to his conflict analysis.

5 MR. PAGE: He didn't say anything about 09:50AM
6 paying money.

7 A Okay. It would not have to do with the
8 payment of money. Well, it would have to do with
9 knowledge, special knowledge I would have gained as
10 a consequence of that engagement of Exponent or the 09:51AM
11 special knowledge that Mr. Hight would have gained,
12 and I would testify that I gained no specific
13 knowledge.

14 MR. GEORGE: Let's take a break.

15 (Following a short recess at 9:51 a.m., 09:51AM
16 proceedings continued on the Record at 10:03 a.m.)

17 VIDEOGRAPHER: We are on the Record. The
18 time is now 10:03 a.m.

19 Q Dr. Fisher, we were talking about the Grand
20 Lake litigation before we broke. Isn't it true, 10:03AM
21 sir, that you had conversations with counsel, Scott
22 McDaniel, regarding the defense of the environmental
23 claims in that litigation as part of your work on
24 that case?

25 A I recall having conversation with Scott 10:03AM

TULSA FREELANCE REPORTERS
918-587-2878

1 McDaniel. With respect to the content of those
2 conversations, I really don't recall them. The job
3 that we had was to stick electronic pins in a map.
4 Didn't involve any judgment and it didn't involve
5 any interpretation. 10:04AM

6 Q Did Mr. McDaniel to your recollection relay to
7 you any of his impressions as to how that would be
8 used in the overall defense of those environmental
9 claims?

10 A I don't recall anything that Mr. McDaniel may 10:04AM
11 have transmitted to me in that regard. If he does,
12 then we vary in our recollections but, again, small
13 job, no judgment involved, no technical advice given
14 with respect to how they should proceed.

15 Q Where is Lithochimeia's office? 10:04AM

16 A Okay. We're located at 110 West 7th Street in
17 Suite 105.

18 Q Isn't it true, sir, that you share an office
19 with some of the attorneys who are representing the
20 State of Oklahoma in this case? 10:05AM

21 A No. As we sit here today, no.

22 Q Okay. Has that been the case in very recent
23 history, that you have occupied offices jointly with
24 one of the law firms that is representing the State
25 of Oklahoma in this lawsuit? 10:05AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Okay, okay. With respect to the form of your
2 question, no, in that it is my understanding that
3 that firm is no longer representing the State of
4 Oklahoma.

5 Q Okay. What firm are we referring to? 10:05AM

6 A The Bell Legal Group.

7 Q And who was the principal attorney of the Bell
8 Legal Group who was involved to your knowledge and
9 in the defense of -- I'm sorry, in the prosecution
10 of this case? 10:06AM

11 A Mr. Page.

12 Q Okay, and Mr. Page was located at 110 West 7th
13 Street?

14 A Yes.

15 Q And you shared an office with Mr. Page, who at 10:06AM
16 that time was working at Bell Legal Group; is that
17 correct?

18 A We shared office space, yes.

19 Q Okay, and Mr. Page is sitting to your right
20 defending you in this deposition; correct? 10:06AM

21 A He is.

22 Q Okay, and Mr. Page is still indeed a lawyer
23 representing the State of Oklahoma in this
24 litigation; is that your understanding?

25 A From all appearances, yes, sir. 10:06AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q You mentioned Alexander Consulting earlier.

2 Is that a group that is run by Tom Alexander?

3 A It is.

4 Q Dr. Fisher, do you consider yourself to be a
5 scientist? 10:06AM

6 A Yes.

7 Q Are you familiar with the scientific method?

8 A Yes.

9 Q Tell me generally what is the purpose of the
10 scientific method. 10:06AM

11 A The purpose of the scientific method -- well,
12 let's look at what it is. It's to form a hypothesis
13 and then test the hypothesis, and it's an intricate
14 procedure.

15 Q Isn't the goal of the scientific method to 10:07AM
16 ensure that the scientist's own biases don't come
17 into the equation and that the process is completed
18 in an objective and scientifically valid fashion?

19 A I would say that's true.

20 Q Would you agree with me that to be 10:07AM
21 scientifically valid, a scientist conducting an
22 investigation or research must keep an open mind?

23 A Yes.

24 Q Okay. Do you agree that to be scientifically
25 valid a scientist conducting an investigation or 10:07AM

TULSA FREELANCE REPORTERS
918-587-2878

1 research must be open to whatever outcome is
2 supported by the facts?

3 A Yes.

4 Q It would not be scientifically valid, would
5 it, sir, for a researcher or a scientist to go into 10:07AM
6 an investigation or a research project with his or
7 her mind closed to one potential outcome?

8 A Of course not.

9 Q And it wouldn't be good science, would it,
10 sir, to start with a conclusion and then work to 10:08AM
11 find a way to justify that conclusion; do you agree
12 with that?

13 A Well, you always start with a conclusion, and
14 a hypothesis is a form for conclusion.

15 Q But in a traditional scientific method 10:08AM
16 approach, the scientist doesn't care whether his
17 hypothesis is ultimately proven to be correct or
18 incorrect; the facts and data takes him where he
19 needs to go; right?

20 A That's true. 10:08AM

21 Q So it would not be good science for a
22 scientist to start with a conclusion and to do
23 whatever is necessary to justify that conclusion; do
24 you agree?

25 A I agree. 10:08AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q You told me earlier that you had seen some
2 information regarding the amount of cattle in the
3 watershed?

4 MR. PAGE: Object to the form.

5 Q Is that correct? 10:08AM

6 A Okay. That actually is not correct.
7 According -- that was not your question.

8 Q Well, let me ask it directly then. How many
9 cattle are in the watershed?

10 A Okay. Cattle in the watershed? I think it's 10:09AM
11 in my production materials. I can't think of the
12 number offhand. I think there's a graph in there
13 somewhere.

14 Q Did you bring any materials with you, sir?

15 A I did not. 10:09AM

16 Q Let me hand you what we'll mark as Exhibit No.
17 2 to your deposition, which I'll represent for you,
18 Dr. Fisher, as well as for the benefit of others and
19 the folks is a document I printed off of a CD that
20 was provided by Mr. Page that was represented to be 10:10AM
21 electronic files that you had used as part of your
22 work on this case. It does not bear the typical
23 number at the bottom for some reason when you print
24 from the CD. Are you familiar with this document?

25 A I am. 10:10AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. What is Exhibit No. 2?

2 A Okay. Exhibit No. 2 is a tabulation of
3 livestock, estimates of livestock numbers for
4 various classes of livestock within the Illinois
5 River watershed from 1949 to 2002. It is based upon 10:10AM
6 U.S. Department of Agriculture, agricultural census
7 data, and the data have been apportioned. Since
8 that data is grained at the level of county, these
9 particular data are apportioned into the watershed
10 on a consistent basis, and that was on the ratio of 10:11AM
11 amount of pasture within the watershed, the amount
12 of pasture that was total -- the total within the
13 county.

14 Q Was that same methodology in terms of
15 apportionment used for all of the livestock 10:11AM
16 reflected in Exhibit No. 2?

17 A Yes.

18 Q Okay. So you used the percent pasture as an
19 apportionment tool for the amount of swine in the
20 watershed? 10:11AM

21 A Yes.

22 Q And you used that same method for the number
23 of broilers in the watershed?

24 A Yes.

25 Q Okay, and the same method for the number of 10:11AM

TULSA FREELANCE REPORTERS
918-587-2878

1 dairy cattle in the watershed; correct?

2 A That's correct.

3 Q What do the percentage of pastures have to do
4 with the number of hogs in the watershed?

5 A Well, it may in fact have a lot to do with the 10:12AM

6 number of hogs in the watershed. One of the

7 limiting issues with respect to poultry, as well as

8 with swine, is for disposal of waste from

9 concentrated feeding operations. That waste

10 disposal is typically done in open spaces, 10:12AM

11 pasture-type spaces. So I would suspect that with

12 respect to the estimate of swine, this is probably a

13 high estimate simply because the -- at least the

14 current distribution of swine operations probably

15 would not support that, but to have a consistent 10:12AM

16 basis for allocation, it was used for all of these.

17 With respect to the poultry, that method of

18 allocation is probably quite fair in that the waste

19 disposal is a limiting piece. With respect to

20 cattle and calves and dairy, it's clearly fair since 10:12AM

21 cattle and calves, as well as dairy cattle, live in

22 pastures and they operate in pastures and feed them.

23 Q Give me the basis for your statement that you

24 believe the method that you chose would

25 underestimate the number of swine in the watershed. 10:13AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A The number of swine operations that are
2 currently in the watershed, and I can't remember the
3 number, but it's very small. I believe in Delaware
4 County it's currently not operating. So the swine
5 operations may be elsewhere, but to apportion all of 10:13AM
6 this on an underlying consistent basis, that's a
7 reasonable way to do it.

8 Q Are you aware of any other scientist that uses
9 the percent pasture to apportion livestock in a
10 watershed other than yourself, Dr. Fisher? 10:13AM

11 A Yeah. I believe not necessarily directly to
12 apportion livestock but --

13 Q Well, that was my question. Answer that one
14 first.

15 A Well, apportioning waste in that Dr. Storm at 10:13AM
16 the Oklahoma State University has used that sort of
17 methodology. To apportion livestock, I would also
18 hasten to add, because of the distribution of
19 pasture inside and outside the watershed, you would
20 generate almost equivalent numbers by looking at 10:14AM
21 proportion of total land area.

22 Q Okay. Do you recall my question?

23 A I recall your question.

24 Q Do you think you've answered it?

25 A Yes, I do.

TULSA FREELANCE REPORTERS
918-587-2878

1 Q I don't think you have. Let's read it back.

2 (Whereupon, the court reporter read
3 back the previous question at Page 52, Lines 8-10.)

4 A Okay. Dr. Engel in conversation -- this
5 was -- this methodology was developed in cooperation 10:14AM
6 with Dr. Engel based upon waste disposal. In direct
7 answer to your question, I do not, but it is a very
8 fair and reasonable basis for making that
9 apportionment.

10 Q Okay. Let me back up for a second. Dr. Engel 10:14AM
11 is another expert who has been retained by the State
12 of Oklahoma in this lawsuit; correct?

13 A That's correct.

14 Q Okay. Just so we've got a complete Record on
15 this, other than experts retained by the State of 10:15AM
16 Oklahoma in the prosecution of this case, sir, are
17 you aware of any other scientists or expert who uses
18 percent pasture to apportion livestock in a
19 watershed?

20 A Not as we sit here today. 10:15AM

21 Q Okay. Now, you, in answering the question the
22 first time, interjected the notion that percent
23 pasture might be a better barometer for waste
24 utilization in a watershed as opposed to the number
25 of livestock; did I interpret your remarks 10:15AM

TULSA FREELANCE REPORTERS
918-587-2878

1 correctly?

2 A Well, the waste utilization because of --
3 let's see. Now, what was your question again?

4 Q You made a comment about, in answering my
5 prior question, about where the waste is applied and 10:15AM
6 how percent pasture in a water -- in a county and
7 watershed basis might be a better indicator of waste
8 application. Did I misunderstand your remark or is
9 that what you said?

10 A I believe that was in the answer to that 10:16AM
11 question.

12 Q Okay.

13 A Yes.

14 Q You have not, sir, in Exhibit No. 2 or in any
15 of your other work in this case evaluated the amount 10:16AM
16 of cattle manure or swine litter generated or
17 applied in the watershed, have you?

18 A You mean have I directly looked at this?

19 Q Sure.

20 A No. 10:16AM

21 Q Why not?

22 A That's part of -- that's outside of the
23 assignment that I had. I was asked to look at the
24 poultry end of this.

25 Q Who asked you to look at that? 10:16AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Okay. Well, Dr. Engel asked me to look at
2 that, and that was what I suggested that we were
3 best suited to look at.

4 Q Why would you be best suited at looking only
5 at poultry? 10:16AM

6 A Well, we had the data, specific data to look
7 at poultry.

8 Q But you've got data right here in Exhibit No.
9 2, do you not, sir, regarding the number of cattle
10 and swine in the watershed; is that correct? 10:17AM

11 A That's correct, and what you're looking at
12 here is historical information. The information
13 that I used in working with Dr. Engel to estimate
14 waste was really for a single time slice that was
15 outside of this data range. It was roughly for 10:17AM
16 2005.

17 Q So if you had available to you data regarding
18 the number of cattle and swine in the same time
19 period, you would have calculated the amount of
20 waste; is that your testimony? 10:17AM

21 A No, that's not my testimony. That's not what
22 I calculated.

23 Q Okay.

24 A I believe others may have calculated that
25 value. 10:17AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. Sir, given the number of cattle/calves
2 in the watershed as of 2002 according to Exhibit No.
3 2, do you consider them to be a significant source
4 of bacteria?

5 A I consider all manure to contain bacteria. 10:18AM
6 With respect to source, one would need to consider
7 things other than simple mass of waste generated.
8 You would also have to consider the timing of that
9 waste disposal within the watershed.

10 Q Let me back up and make sure I heard you 10:18AM
11 correctly. Dr. Fisher, you would agree with me that
12 simply comparing the amount in terms of number of a
13 particular animal species in the watershed with
14 water quality data is not a valid way of determining
15 source; is that right? 10:18AM

16 A No.

17 Q Okay. What's wrong with what I said?

18 A Well, you said -- because the question assumes
19 that you know nothing else.

20 Q Okay, but let's take that analysis standing 10:19AM
21 alone. Okay? Comparing the number of a particular
22 species in the watershed with water quality data,
23 what, if anything, can that tell you about whether
24 that animal species is the cause of degradation of
25 water? 10:19AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Ahh. Well, if you were looking -- for
2 example, if you had a measure of the history of
3 waste inputs to the system, you could, for example,
4 look at the proportional increase from what looks
5 like a baseline value to the present and compare 10:19AM
6 that to the proportional increase in number of a
7 particular component here, even just in number.

8 Q Do you think that's a valid way of determining
9 a source?

10 A It's one way to determine a source, and I 10:19AM
11 believe it's valid.

12 Q Do you believe it is valid standing all by
13 itself?

14 A I think one always likes to find additional
15 supporting information. 10:20AM

16 Q Can you answer my question? Is it valid in
17 and of itself?

18 MR. PAGE: Object to the form.

19 A Is it valid in and of itself? What do you
20 mean by valid in and of itself? 10:20AM

21 Q Would you take the stand, sir, and testify
22 that poultry litter or poultry production is the
23 source of substantial pollution to Lake Tenkiller or
24 its tributaries based simply on comparing the growth
25 and the amount of poultry produced in the watershed? 10:20AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A As I've said in an earlier answer, you would
2 consider other factors in the production cycle.

3 Q That's not my question. If that's all you
4 had, sir, if that's all the evidence that you had
5 regarding source, would that be enough for you to
6 offer an opinion as to causation?

10:20AM

7 A Just number?

8 Q Just number.

9 A I think you could make an opinion as to
10 causation from number alone.

10:20AM

11 Q That would be enough for you?

12 A Well, I think it would be enough for many if
13 you -- absent any additional information, you would
14 look at the waste generation. You would want to
15 have some feeling for the waste generation as a
16 function of number.

10:21AM

17 Q You haven't compared waste generation over
18 time for poultry with water quality, have you?

19 A With water quality? Not directly with water
20 quality.

10:21AM

21 Q Okay. You haven't compared the waste
22 production over time for poultry with the
23 concentration of constituents and sediment, have
24 you?

25 A Would you say that again?

10:21AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q I can try. Dr. Fisher, you have not compared,
2 have you, sir, the changes in the number of birds
3 raised in the watershed with the concentration of --

4 MR. GEORGE: Can you reread my question?

5 (Whereupon, the court reporter read
6 back the previous question at Page 58, Lines
7 21-24.)

8 A You mean have I made a graph of that?

9 Q Well, have you compared it in whatever sense?

10 A Yes. 10:22AM

11 Q Okay. How have you compared it?

12 A I prepared graphical displays of sediment
13 chemistry as a function of age of deposition of
14 those sediments to livestock populations within the
15 watershed. That analysis is ongoing. That's the 10:22AM
16 state of it at the moment.

17 Q Perhaps my question wasn't clear, sir. My
18 question was, have you compared waste application
19 for poultry litter with concentrations of any
20 constituent in sediment? 10:22AM

21 MR. PAGE: Object to the form.

22 A Waste application?

23 Q Yes, sir.

24 A I have compared numbers of organisms to
25 concentrations in sediment. The numbers of the 10:23AM

TULSA FREELANCE REPORTERS
918-587-2878

1 organisms in my opinion and in Dr. Engel's opinion,
2 I believe, are surrogates for waste application.

3 Q You think Dr. Engel has offered opinions about
4 the amount of waste produced over time in the
5 watershed by poultry? 10:23AM

6 A No.

7 Q Okay. So what were you referring to then in
8 terms of Dr. Engel's opinion?

9 MR. PAGE: Object to the form.

10 A Okay. The number of organisms, number of 10:23AM
11 broilers, the number of layers, number of pullets,
12 number of turkeys, the number of cattle, number of
13 swine and so on, are related to generation of waste.
14 Each one generates fecal waste. They generate them
15 in a little bit different way. With respect to 10:23AM
16 cattle and calves and dairy cattle, those organisms
17 live in space typically, frequently live in space,
18 and defecate on the landscape, and to the extent
19 that they're present in pastures throughout the year
20 or maybe in the winter at feeding stations, they 10:24AM
21 would defecate there, but in general their
22 defecation is distributed in both time and space.

23 With respect to the broil -- the poultry
24 industry, these organisms are raised in confined
25 areas. Their fecal wastes are deposited on the 10:24AM

TULSA FREELANCE REPORTERS
918-587-2878

1 floors of those confined areas within what is
2 generally construed as litter, that is the
3 cellulosic material that is placed there to take up
4 those wastes, and then on a regular basis, typically
5 recommended to be annual by some of the integrators,
6 those wastes are taken out of the barns and applied
7 to fields.

10:24AM

8 Q Where are those fields?

9 A The fields are near the barns.

10 Q Are the fields always in the watershed?

10:25AM

11 A No.

12 Q Okay. You concede there's transport of
13 poultry litter out of the watershed; correct?

14 A Yes, and there's transport of poultry litter
15 into the watershed.

10:25AM

16 Q But you can't assume, can you, sir, in any
17 valid sense, that the generation of litter in the
18 watershed equals the application of litter in the
19 watershed?

20 A Given the short distance of transport of the
21 litter, I think that you can make that assumption,
22 that generation and -- absent long distance
23 transport, generation is equivalent to disposal.

10:25AM

24 Q Is it your understanding, sir, that there's no
25 long distance transport of poultry litter out of the

10:25AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Illinois River watershed?

2 A No. It's my understanding, in fact, of recent
3 date that there is long distance transport of
4 poultry litter from the Illinois River watershed.

5 Q Okay. So in light of that, let's go back to 10:26AM
6 where we were. We can't assume, can we, sir, in any
7 valid sense that the generation of poultry litter in
8 the watershed equals the amount of poultry litter
9 land applied in the watershed?

10 A Okay. Prior to long distance transport, we 10:26AM
11 can assume that generation of poultry litter within
12 the watershed is equivalent to disposal within the
13 watershed. Once one is looking at long distance
14 transport, you would adjust that or you might adjust
15 that for the long distance transport. 10:26AM

16 Q Okay. Let's talk about the present, right
17 now.

18 A Okay.

19 Q Okay. Can we assume, sir, in any valid sense
20 that the generation of poultry litter in the 10:26AM
21 watershed is equal to the amount of poultry litter
22 applied in the watershed?

23 A Okay. Let's look -- if we define the present
24 as 2006 --

25 Q I want to define the present as today. 10:27AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I want to define the present as 2006.

2 MR. ELROD: But that's not the present.

3 Q It's not the present.

4 A You would need to have the record -- okay.

5 What's the answer to your question? You would need 10:27AM

6 to have --

7 Q Hang on. Let's go back. Reread my question.

8 MR. PAGE: Objection.

9 Q Hang on. I want a question and an answer.

10 MR. PAGE: Objection to the form. He's 10:27AM

11 prepared to answer your question.

12 MR. GEORGE: Well, he may be prepared, but
13 he hasn't done it.

14 MR. PAGE: He was just about to before you
15 interrupted him. 10:27AM

16 MR. GEORGE: Can you reread the question,
17 please?

18 (Whereupon, the court reporter read
19 back the previous question and answer at Page 62,
20 Lines 19-25.) 10:28AM

21 Q Can you answer that question?

22 A Yes, I can answer the question. Given the
23 tonnage of litter or waste transported from the
24 watershed, if I subtracted that amount from the
25 waste generated within the watershed, that would be 10:28AM

TULSA FREELANCE REPORTERS
918-587-2878

1 equivalent to the amount deposited within the
2 watershed.

3 Q Does that mean, sir, that the answer to my
4 question is we cannot assume that the amount of
5 litter generated in the watershed at present is
6 equal to the amount of litter land applied in the
7 watershed?

10:28AM

8 A Okay. You are breaking -- I think that the
9 issue here is that you have to look at the system
10 that's in place to dispose of this waste to be able
11 to estimate the amount of material that's disposed
12 within the watershed.

10:28AM

13 Q Dr. Fisher, is there a reason you won't answer
14 my question?

15 MR. PAGE: Object to the form.

10:29AM

16 A I think I am answering your question. I'm
17 really trying to.

18 Q I want to try it one more time, and I'm going
19 to tell you in advance that I'm going to play this
20 video for the court, okay --

10:29AM

21 A Uh-huh.

22 Q -- and I want to give you an opportunity to
23 answer what I think is a straightforward question,
24 and I know your counsel is going to object to what I
25 just said and that's fine.

10:29AM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: I don't think you need to be
2 making a speech. Why don't you just ask a question?

3 MR. GEORGE: I've asked it three times,
4 David.

5 MR. PAGE: And he's answered it -- 10:29AM

6 MR. GEORGE: No, he hasn't.

7 MR. PAGE: -- three times. So stop making
8 speeches and just ask the question.

9 MR. GEORGE: The Record will speak as to
10 whether he's answered the question. I'm going to 10:29AM
11 try it one more time.

12 Q Dr. Fisher, can we assume in any valid sense
13 that the generation of poultry litter in the
14 watershed at present is equal to the amount of
15 poultry litter to be applied in the watershed? 10:29AM

16 A And I will say the amount of poultry litter
17 generated in the watershed minus that amount that is
18 transported out of the watershed is equal to the
19 amount disposed in the watershed.

20 Q Where we got off track a moment ago, sir, was 10:30AM
21 on Exhibit No. 2. Do you still have it in front of
22 you?

23 A I do.

24 Q Okay, and how many cattle, calves were in the
25 watershed in 2002 according to your analysis? 10:30AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A In this analysis, 291,583.

2 Q Do you consider that to be a significant
3 number of cattle?

4 A I consider it to be 291,583.

5 Q Okay. How much manure do those cattle 10:30AM
6 generate?

7 A I can't give you an answer off the top of my
8 head.

9 Q Okay. Do you consider cattle, 291,583 head of
10 cattle, calves in the watershed in 2002 to be 10:30AM
11 significant in terms of their potential to
12 contribute bacteria to both groundwater and surface
13 water?

14 A I would consider them to be contributors to
15 groundwater and surface water, potential 10:31AM
16 contributors to it.

17 Q Are they significant contributors, sir?

18 A Potentially.

19 Q Okay. What analysis would you need to conduct
20 to confirm whether they were or were not significant 10:31AM
21 contributors to bacteria in the water?

22 A Well, if I were to be making that judgment, I
23 would attempt to estimate the bacterial production
24 by cattle and calves and other -- well, all the
25 creatures there, and then deposit that on the 10:31AM

TULSA FREELANCE REPORTERS
918-587-2878

1 landscape in the -- over the timing that is used to
2 deposit them within the landscape.

3 Q You're familiar with the work of Dr. Engel in
4 estimating the amount of poultry litter generated in
5 the watershed at approximately 347,000 tons 10:31AM
6 annually?

7 A I am.

8 Q Okay. Sir, would it be significant to your
9 work in this case if you were informed that the
10 amount of manure generated by cattle, 291,000 head 10:32AM
11 of cattle in the watershed was actually much greater
12 than the amount of poultry litter generated in the
13 watershed?

14 MR. PAGE: Object to the form.

15 A I would have to evaluate the numbers. 10:32AM

16 Q How much higher than poultry litter would it
17 have to be to be significant to you?

18 MR. PAGE: Object to the form.

19 A I don't know.

20 Q Okay. Are septic tanks a source of bacteria 10:32AM
21 in either groundwater or surface water in the
22 Illinois River watershed?

23 A Okay. All the scientific literature that
24 discusses bacteria in groundwater and surface water
25 speaks to septic tanks being a potential source. 10:32AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. So in light of that recognition in the
2 scientific literature, sir, do you consider septic
3 tanks to be a significant source of bacteria in the
4 Illinois River watershed?

5 A I've not attempted to evaluate the 10:33AM
6 significance. I would say that human population,
7 though, in the present day is 300,000 or so.
8 There's just -- there's a whole lot more poultry
9 waste than there is human waste.

10 Q Where is the human waste stored in septic 10:33AM
11 tanks; is it on the surface or beneath the surface?

12 A In a septic tank itself, the septic material,
13 there's a tank in which it's subsurface typically.

14 Q Aren't there also leach fields associated with
15 septic tanks that disseminate some of the material 10:33AM
16 out into the subsurface?

17 A Yes.

18 Q Okay. Given the proximity of septic tanks to
19 groundwater because they're beneath the surface, are
20 they more or less likely to influence groundwater 10:33AM
21 than poultry litter applied on the surface at the
22 same location?

23 A Given the fact that poultry litter is applied
24 over larger areas, I would have a hypothesis,
25 not tested, so it would be a hypothesis that the 10:34AM

TULSA FREELANCE REPORTERS
918-587-2878

1 poultry litter would have a greater propensity to
2 contaminate groundwater and surface water. Larger
3 area, more opportunity to infiltrate and it's
4 applied at the surface, and as a consequence, runoff
5 from that surface would contain bacteria from the 10:34AM
6 poultry litter. I think our sampling demonstrates
7 that.

8 So when you talk about significance of a
9 source, you need to consider, as you have in your
10 question, location of the source. So you could 10:34AM
11 think of a septic tank really as sort of a point
12 source, and poultry litter as a very broad aerial
13 source. The poultry litter is deposited in a
14 relatively limited time window. Although it is
15 deposited around the watershed throughout the year, 10:35AM
16 it's a relatively limited time when most of it is
17 land applied.

18 Q I think maybe you misinterpreted my question.
19 I tried to ask it in the context of groundwater.
20 With respect to the potential to impact groundwater, 10:35AM
21 would you consider the likelihood of septic tanks
22 contributing bacteria to groundwater to be greater
23 than poultry litter applied to the surface?

24 MR. PAGE: Object to the form.

25 A I've not made that evaluation. I would 10:35AM

TULSA FREELANCE REPORTERS
918-587-2878

1 believe, because poultry litter is applied, that the
2 flux of bacteria from poultry litter is more
3 concentrated and over a broader area and, therefore,
4 would be a greater risk to groundwater and, indeed,
5 numerous scientific papers that have been written
6 concerning groundwater contamination within this
7 watershed have found attributes, chemical attributes
8 of poultry waste in the groundwater and have found
9 bacterial contamination to, in general, be greater
10 beneath the areas where there's a lot more
11 agricultural activity.

10:36AM

10:36AM

12 Q Can you identify for me, sir, the papers that
13 you're referring to that have identified poultry
14 litter and its constituents as a contaminant of
15 groundwater?

10:36AM

16 A Well, poultry litter constituents as a
17 contaminant of the groundwater, the source of those
18 constituents being poultry waste, I can think of
19 works by Adamski --

20 MR. ELROD: A-D-A-M-S-K-I?

10:36AM

21 A Yes, and Steele as another author off the top
22 of my head. Those documents are in my production.

23 Q Give me just a moment, sir, to see if I
24 happened to have brought either of those two papers
25 with me.

10:37AM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: I'll just object to that. I
2 assume that's a question. I don't think he
3 mentioned two papers. I think he mentioned two
4 authors.

5 MR. GEORGE: Okay.

10:37AM

6 MR. PAGE: It's possible those authors may
7 have written more than one paper.

8 Q I'll hand you what we'll mark as Exhibit No. 3
9 to your deposition, which I'll represent to you, Dr.
10 Fisher, is not a complete copy of the report. It is
11 a report by K. F. Steele as one of the investigators
12 entitled Pollution Susceptibility Mapping For Rural
13 Development and Land Use Planning in Carbonate
14 Terrain in Northwest Arkansas. Is this one of the
15 papers you were referring to?

10:38AM

16 A Okay. One of the authors I was referring to.

17 Q Okay. Do you see, and I didn't bring the
18 whole paper because I frankly didn't want to make
19 copies of all of it, but I did copy a particular
20 portion that I was interested in. Do you see the
21 underlined language on the second page of Exhibit 3?

10:38AM

22 A Yes, I do.

23 MR. PAGE: I'd just like to make an
24 objection that you are going to be examining this
25 witness with only a partial piece of the exhibit

10:38AM

TULSA FREELANCE REPORTERS
918-587-2878

1 that was produced.

2 Q Do you see the underlined sentence, Dr.
3 Fisher?

4 A I do.

5 Q Okay, and this is, by the way, a document you 10:38AM
6 produced; correct?

7 A Yes, it is.

8 Q Okay. You've read the entire study; correct?

9 A Yes, I have.

10 Q Okay. Could you read the underlined sentence? 10:39AM

11 A Yes. It says in this particular paper, and
12 this is at my production number 4422, the underlined
13 sentence reads, contamination of off-linear wells
14 has been attributed to lack of sufficient casing in
15 the wells, poor soil filtration and close proximity 10:39AM
16 to septic tanks.

17 Q What's an off-linear well?

18 A In this case what they're looking at are
19 features called lineaments, which are air photo
20 identifiable linear features, that within the 10:39AM
21 Illinois River watershed are correlated with
22 subsurface faults and fractures. Those subsurfaces
23 faults and fractures are zones of infiltration into
24 the subsurface, into the groundwater system.

25 Q Do you agree with me that the authors 10:40AM

TULSA FREELANCE REPORTERS
918-587-2878

1 concluded that septic tanks were the source of those
2 off-linear or one of the sources of those off-linear
3 contamination of wells?

4 A No.

5 Q Okay. They didn't conclude that? 10:40AM

6 A No, because in plain language in the document
7 it reads -- it's a supposition. He reads,
8 contamination of off-linear wells has been
9 attributed to three things, sufficient/insufficient
10 casing of the wells, poor soil filtration and close 10:40AM
11 proximity to septic tanks. So close proximity to
12 septic tanks is one theory that he puts forward.
13 The other theories are that there's a lack of a
14 sufficient casing, there's poor protection from the
15 surface contamination, which could include poultry 10:41AM
16 litter, and poor soil filtration, which means
17 materials could move through the soil into the
18 underlying bedrock and into the well. So it's not a
19 conclusion that it has to do with septic tanks.
20 It's a hypothesis as it's posited here. 10:41AM

21 Q He uses the term attributed; correct; that's
22 the term used in the paper, attributed to, among
23 other things, close proximity to septic tanks;
24 correct?

25 A Okay. Again -- 10:41AM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: Object to the form of the
2 question.

3 A -- he says has been attributed. He does not
4 cite who it is attributed by, whether it's
5 attributed by him or not, whether he's making that 10:41AM
6 conclusion, and there are three attri -- even
7 accepting attribution as a conclusion, and he has
8 three conclusions. One is that there's some form of
9 surface source that would contaminate the wells
10 because there was some sort of insufficiency of the 10:41AM
11 surface casing or the soil filtration, which we have
12 discussed earlier, was not operatious at that
13 locale. I would say there's an additional notion
14 here and, that is, that the amount of poultry waste
15 is so pervasive in this watershed, that even wells 10:42AM
16 that are off these linear vertical fairways for
17 fluid transport have become contaminated. That's an
18 alternate.

19 Q Did Mr. Steele come to that conclusion in his
20 work? 10:42AM

21 A Not in this relatively early piece of work.

22 Q Have you seen any publication by Mr. Steele
23 where he reached the conclusion that you just
24 hypothesized about?

25 A No. 10:42AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay.

2 A Not that specific one.

3 Q But you do agree with me that Mr. Steele
4 identified septic tanks as a potential source that
5 ought to be evaluated?

10:42AM

6 MR. PAGE: Object to the form.

7 Q For contribution to bacteria levels in wells?

8 MR. PAGE: Same objection.

9 A I think what I'll agree with you is that he
10 cites septic tanks as a potential source of
11 bacterial contamination to wells.

10:43AM

12 Q Okay. What did you do to investigate septic
13 tanks as a source for contamination in any of the
14 wells that you had data on?

15 A Okay. I did not do anything in particular to
16 investigate that particular source other than to
17 just in a general sense look at the human population
18 in the watershed as a whole.

10:43AM

19 Q Would it not be relevant to determining
20 source, sir, of bacteria in a well to know whether
21 or not there is a septic tank in close proximity to
22 that well?

10:43AM

23 A Oh, oh, oh, oh. In the protocol for sampling
24 wells, my recollection is if you have that -- my
25 recollection of that protocol is that the location

10:44AM

TULSA FREELANCE REPORTERS
918-587-2878

1 of the septic tank was known.

2 Q Okay, all right. Let me back up. I want to
3 explore protocol in a moment, but I want to make
4 sure we have a point of agreement first. You do
5 agree with me, sir, that the location of a septic 10:44AM
6 tank in close proximity to a well where you have
7 found bacteria is an important factor that ought to
8 be considered?

9 A We would consider that, yeah.

10 Q Okay. Now, I believe your testimony is that 10:44AM
11 you believe the protocol for well sampling conducted
12 by the attorney general's consultants in this case
13 required the collection of that information,
14 proximity to septic tanks?

15 A I believe that's correct. 10:44AM

16 Q Okay. Are you recalling a particular
17 protocol?

18 A A protocol having to do with groundwater
19 sampling.

20 Q And who was responsible for collecting that 10:44AM
21 information?

22 A The field team.

23 Q And have you seen the results of any effort by
24 the field team to actually collect that information
25 for well sampling efforts? 10:45AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I'm sure I have, but I've seen so much that I
2 don't recall it specifically.

3 Q In what form would it be? The reason I'm
4 asking these questions --

5 A It could be in field books. 10:45AM

6 Q Okay. You think you've seen reference to
7 septic tanks in field books?

8 A Yes.

9 Q Okay. Do you believe you've seen reference to
10 septic tanks in connection with sites sampled in any 10:45AM
11 place other than field books?

12 A I don't recall.

13 Q Okay. I'm going to hand you another and it's
14 another partial paper, I apologize, but it's Exhibit
15 No. 4. 10:45AM

16 MR. PAGE: I'll just make the same
17 objection.

18 MR. GEORGE: You can have a standing
19 objection to that, if you like, David.

20 MR. PAGE: Thank you. I would like that. 10:45AM

21 MR. GEORGE: I would say for the Record,
22 Dr. Fisher has all of these documents. Obviously he
23 produced them, but I understand your desire to make
24 an objection.

25 MR. PAGE: The desire is to make sure the 10:46AM

TULSA FREELANCE REPORTERS
918-587-2878

1 witness has a full record in front of him to testify
2 from.

3 MR. ELROD: Have you got his production
4 here at Riggs Abney, David?

5 MR. PAGE: I think I have a copy of it on 10:46AM
6 disk in my computer, yes.

7 MR. ELROD: Okay.

8 Q Dr. Fisher, you recall this paper by -- it
9 appears to be a dissertation submitted by Darrin
10 Curtis at University of Arkansas? 10:46AM

11 A Yes.

12 Q Where did you obtain this?

13 A This would have been obtained from the
14 University of Arkansas archives.

15 Q You actually went to the library and found 10:46AM
16 this paper; correct?

17 A Somebody under my direction did, yes.

18 Q Okay, and the title of the paper is Integrated
19 Rapid Hydrogeologic Approach to Delineate Areas
20 Affected By Adjective (sic) Transport and Mantled 10:46AM
21 Karst With an Application to Clear Creek Basin in
22 Washington County, Arkansas; correct?

23 A Almost correct. It's advective, which would
24 be flow, not adjective which is just part of our
25 common dyslexia. 10:47AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q I thought I said advective.

2 A Yes.

3 Q Okay. In Mr. Curtis' dissertation, he
4 discusses a literature review on Page 3; do you see
5 that in front of you? 10:47AM

6 A Yes.

7 Q And he talks about the rapid population growth
8 in northwest Arkansas. Are you familiar with that?

9 A Yes.

10 Q Okay. You're aware of the fact that there has 10:47AM
11 been substantial urban development over the past two
12 decades in Benton and Washington County?

13 A The urban development in Benton and Washington
14 County over the past two decades with respect to the
15 Illinois River watershed has been on the eastern 10:47AM
16 boundary, far eastern boundary of that watershed and
17 has proceeded somewhat to the west.

18 Q Okay, but you don't disagree with the idea
19 there's been substantial urban development in
20 northwest Arkansas in portions of the Illinois River 10:47AM
21 watershed?

22 A I'd say there's been urban development within
23 portions of the Illinois River watershed, in the
24 eastern portion of that watershed primarily.

25 Q Do you see the concern that is expressed by 10:48AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Mr. Curtis regarding urban development, septic tank
2 use and housing development?

3 A Yes. Well, here's what I see. Would you like
4 me to read that into the Record, Mr. George?

5 Q Sure, sure. 10:48AM

6 A This is in his literature review and under a
7 subheading entitled need for the project. Mr.

8 Curtis states, rapid population growth on a

9 landscape underlaine by Karst features, such as

10 caves, sink holes and conduits within the shallow 10:48AM

11 aquifers is characterized by numerous environmental

12 and ecological problems. In northwest Arkansas

13 Karst features are becoming an increasing concern

14 for environmentalists, housing developers and city

15 and state governments, especially with respect to 10:49AM

16 siting urban development, landfills, transportation

17 centers, septic tank use, sewage treatment plants

18 and handling contamination problems already present,

19 and I think that probably covers the significant

20 portion of this. 10:49AM

21 Q I'm sorry. Did you want to say something
22 else?

23 A Yes, I did.

24 Q I didn't mean to cut you off.

25 A So what he's talking about here is quite true, 10:49AM

TULSA FREELANCE REPORTERS
918-587-2878

1 that is, in an area or that portion of the watershed
2 that is undergoing urban development, in that
3 portion, the important sources that were the
4 concerns of environmental contamination, especially
5 of shallow groundwater, on a Karst terrain are going 10:50AM
6 to be sources that are related to urban setting.

7 That's absolutely correct. In areas that are still
8 rural, those sources would be agricultural, and it's
9 a general concern, and because of the nature of
10 this, you really can view the watershed as broken 10:50AM
11 like a china cup. It's a broken cup, and it's
12 leaking and putting materials anywhere on the
13 surface, it puts groundwater at risk there. That's
14 as I read his first paragraph.

15 Q As well as putting materials under the surface 10:50AM
16 in terms of septic tanks; correct?

17 A To the extent that septic waste escapes from
18 those and can infiltrate downward, yes.

19 Q Okay. Do you agree that urban development and
20 a substantial expansion in urban development in a 10:50AM
21 watershed creates the potential for increasing
22 bacteria levels both in groundwater and surface
23 water?

24 A Urban development has a lot of effects, one of
25 which may be a greater threat of bacterial load to 10:51AM

TULSA FREELANCE REPORTERS
918-587-2878

1 groundwaters within the urban development area
2 itself, that being the source, and in surface waters
3 that emanate from an urban development could also
4 have bacteria sourced from that.

5 Q Okay. Have you evaluated the extent to which 10:51AM
6 any increase in bacteria levels in either surface
7 water or groundwater is explained by urban
8 development in northwest Arkansas?

9 A I have not personally done that.

10 Q Okay. Let's go back to Exhibit No. 2, which 10:51AM
11 is your livestock population. What were the number
12 of swine in the watershed in 2002?

13 A According to this allocation, the number of
14 swine estimated to be in the watershed from the 2002
15 census data were 208,243. 10:52AM

16 Q How much waste do those swines create that are
17 raised in the watershed?

18 A I'm sure they create waste. I've not made
19 that calculation.

20 Q Okay. Do you believe it to be a substantial 10:52AM
21 amount of waste?

22 A I believe it to be the amount of waste that
23 they would generate. Whether it's substantial or
24 not would be in comparison to other waste streams
25 and timing of their disposal and so on. 10:52AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q When you say in comparison to other waste
2 streams, you would say, for example, one way to
3 define substantiality would be comparing it to the
4 amount of poultry litter?

5 A You could take a look not only in terms of 10:52AM
6 amount but also how it's disposed.

7 Q Okay. How is swine waste disposed of in the
8 watershed?

9 A Swine waste, when it is disposed and in the
10 times I've seen disposal, have actually not been in 10:53AM
11 the watershed but in the Eucha-Spavinaw watershed.
12 The swine waste is a liquid waste from an anaerobic
13 lagoon typically on the swine production site, and
14 it's disposed by land application generally very
15 near where it's generated. 10:53AM

16 Q Okay. Would that liquid waste contain
17 bacteria?

18 A Yes.

19 Q Okay. Do you have any reason to believe that
20 swine, the waste disposal practices in the Illinois 10:53AM
21 River watershed differ from those you've seen in
22 Eucha-Spavinaw?

23 A No, just as I have no reason to believe that
24 waste disposal practices generally would differ.

25 Q With regard to dairy cattle, how many dairy 10:53AM

TULSA FREELANCE REPORTERS
918-587-2878

1 cattle had you estimated in the watershed in 2002?

2 A 10,280.

3 Q Okay, and how much waste do those dairy cattle
4 create?

5 A I've not made that estimate to this purpose. 10:54AM

6 Q Okay. Do you believe they create a
7 substantial amount of waste?

8 A I believe they would create waste. They would
9 be creating waste probably less than the cattle and
10 calves but they would create waste. 10:54AM

11 Q Okay. Where does that waste go?

12 A Okay. Dairy waste sort of depends on how the
13 dairy is operated. If it's operated largely as a
14 grain feeding operation in a closed place, it could
15 go into a lagoon. I don't believe there are any 10:54AM
16 like that in the watershed. Typically the -- you
17 would treat their waste -- if they're pastured dairy
18 cattle, their waste would go onto pastures, just
19 like it does with cattle and calves.

20 Q Okay. So land application, whether it be as a 10:54AM
21 result of human introduction or the actual deposit
22 by the cows?

23 A This would be non-anthropogenic land
24 application.

25 Q You consider dairy cattle manure to be a 10:54AM

TULSA FREELANCE REPORTERS
918-587-2878

1 significant source of bacteria in the watershed?

2 A I consider dairy cattle manure to be a source
3 of bacteria. Its significance, again, has to do
4 with total mass, timing of application and
5 distribution in space. 10:55AM

6 Q You haven't been asked to evaluate the
7 significance of bacteria from dairy cattle, swine or
8 cattle generally; correct?

9 A No, not here, not now.

10 Q Well, have you been asked to do it someplace 10:55AM
11 else some other time?

12 A No, I mean, not at this time I haven't been.

13 Q With regard to the type of bacteria that's
14 found in waste from different animals, do you know
15 if cattle manure contains fecal coliforms? 10:55AM

16 A Okay. I'm not a microbiologist.

17 Q I understand that.

18 A So in terms of the species of bacteria, it
19 would contain species of bacteria that lived within
20 the guts of warm-blooded animals, and if those 10:55AM
21 include fecal coliforms, coliform is associated with
22 feces as a broad group of organisms, then I would
23 anticipate it would.

24 Q Okay, but you don't know offhand whether
25 cattle manure would contain fecal coliforms or not? 10:56AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I would anticipate if I tested it, it would
2 contain fecal coliforms.

3 Q Okay. What about enterococcus?

4 A I don't know.

5 Q E. coli? 10:56AM

6 A Since that would be a form of coliform
7 bacteria as a subset of fecal coliforms, I would
8 anticipate that, yeah.

9 Q What about Salmonella?

10 A Don't know. 10:56AM

11 Q Okay. Do you agree or do you understand that
12 swine litter and dairy cattle litter would also
13 contain at least fecal coliforms and E. coli?

14 A I would imagine that all of these organisms,
15 being warm-blooded organisms, would produce manures 10:56AM
16 containing numerous species of bacteria.

17 Q Okay. Dr. Fisher, did you make any attempt in
18 your work in this case to exclude any of these
19 sources, cattle, swine or dairy cattle or septic
20 tanks, as the explanation for bacteria that you 10:57AM
21 found in any groundwater, springs, streams or rivers
22 in the Illinois River watershed?

23 A I didn't make any attempt to either exclude or
24 include them, no.

25 MR. GEORGE: I think we need to change the 10:57AM

TULSA FREELANCE REPORTERS
918-587-2878

1 tape.

2 VIDEOGRAPHER: We're off the Record. The
3 time is 10:57 a.m.

4 (Following a short recess at 10:57
5 a.m., proceedings continued on the Record at 11:04
6 a.m.)

7 VIDEOGRAPHER: We are on the Record. The
8 time is 11:04 a.m.

9 MR. GEORGE: Mr. Page, on the break we had
10 someone checking the Teaf materials to see if they 11:04AM
11 could identify the manure or waste production
12 estimates other than poultry litter within those
13 materials that you recalled had been produced as
14 part of Teaf's materials, and we've been unable to
15 find those. So I want to make a formal request for 11:04AM
16 the production of those materials, regardless of
17 what expert is the keeper.

18 MR. PAGE: Just would you put it in a
19 letter for me, please, because --

20 MR. GEORGE: We're going to have -- 11:04AM

21 MR. PAGE: -- from the conversation that we
22 had, I want to make sure I understand what you're
23 asking for and we're talking about the same thing.

24 MR. GEORGE: We've got a written Record
25 right here from our conversations, so I think it's 11:04AM

TULSA FREELANCE REPORTERS
918-587-2878

1 clear enough. I frankly don't want to go through
2 the time and delay associated with create --
3 drafting a letter after this deposition to have you
4 respond to it. Either the State is willing to
5 produce that analysis or they're not. 11:05AM

6 MR. PAGE: Well, I want to make sure we
7 were communicating correctly and I was talking about
8 the same analysis you were on the questions. So if
9 you wouldn't mind sending me even an E-mail
10 identifying the information you asked for -- I think 11:05AM
11 in the past you've done that and we've been able to
12 respond relatively quickly. I think it was the next
13 day, in fact, Mr. George. So I'D just appreciate
14 that so there's no confusion.

15 MR. GEORGE: I'm not trying to create 11:05AM
16 confusion. Part of the problem I have is what I
17 want, David, is what your witness has identified,
18 and so the two of you are in a better position to
19 determine what it was he was talking about than I
20 would be, having not seen the document. 11:05AM

21 MR. PAGE: Well, I don't know what you are
22 asking for. That's all -- I want to make sure I
23 understood what you're asking for.

24 MR. GEORGE: Okay. I'll send you an
25 E-mail. 11:05AM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. ELROD: David, we've got Dr. Olsen on
2 Friday; that could be relevant. We've got Dr.
3 Lawrence on Monday; that could be relevant. We have
4 Dr. Harwood on next Tuesday, and we have Teaf
5 himself on the 31st. So we really need to know the 11:06AM
6 answer to your question like today.

7 MR. PAGE: I just want to make sure I
8 understand the question. So would you please send
9 me an E-mail?

10 MR. GEORGE: I'll send you an E-mail over 11:06AM
11 lunch.

12 Q All right. Dr. Fisher, I believe you told me
13 that you have not attempted to either exclude or
14 include other animal species as a source of bacteria
15 found in any of the sampling data; correct? 11:06AM

16 A That's correct.

17 Q Okay. Given that, sir, are you in a position
18 to offer any opinion in this case regarding the
19 relative contribution of poultry litter as a source
20 of bacteria in comparison to any other source? 11:06AM

21 A Based upon the distribution in time and space
22 of poultry litter disposal within the watershed and
23 taking a look at the gross number of animals that
24 are involved, but especially the timing and spatial
25 distribution of disposal, I would have the opinion 11:07AM

TULSA FREELANCE REPORTERS
918-587-2878

1 that they are a highly significant source of
2 contamination within the watershed.

3 Q And you have that opinion based on the number
4 of birds in the watershed and their temporal and
5 spatial distribution; is that correct? 11:07AM

6 A No, not their temporal and spatial
7 distribution. The temporal and spatial distribution
8 of waste disposal.

9 Q Okay. Let me try my question again because I
10 was trying to be precise. Sir, are you in a 11:07AM
11 position to offer an opinion regarding the relative
12 contribution of poultry litter in comparison to any
13 other source in the watershed --

14 MR. PAGE: Object to the form.

15 Q -- in terms of bacteria? 11:07AM

16 MR. PAGE: Excuse me. Object to the form.

17 A Based upon additional data, data being stuff
18 that Dr. Olsen will really talk about that I've
19 looked at, that the chemical signature of poultry
20 litter is pervasive within the watershed, and the 11:08AM
21 work of Dr. Harwood, who indicates that a particular
22 bacterial component that is only known in poultry
23 litter is found extensively within the watershed,
24 including within groundwater, and it is not found in
25 other things, and that the chemical signature 11:08AM

TULSA FREELANCE REPORTERS
918-587-2878

1 excludes both human waste, as well as the waste of
2 cattle and calves, swine and dairy cattle, I would
3 say that beyond -- the highly significant waste
4 source in the watershed is poultry.

5 Q You answered my question with reference to 11:08AM
6 work being done by Drs. Harwood and Olsen; correct?

7 A That's correct.

8 Q Okay. I want to separate, if I can, because
9 we have multiple witnesses that are going to

10 testify, and the defendants are entitled to know 11:09AM

11 what your, Bert Fisher's opinions are separate and
12 apart from what other experts' opinions are, based
13 on the work you've done. Okay? So with that as a
14 foundation, sir, are you going to testify in this

15 case as to the relative contribution of poultry 11:09AM

16 litter as a source of bacteria found in water in
17 comparison to any other source?

18 MR. PAGE: Object to the form.

19 A It is my understanding and it is certainly
20 my -- the conclusions that are put forward as the 11:09AM
21 items in this affidavit would be what I would be
22 anticipated to testify to at trial.

23 Q Okay. Do you offer a comment on the relative
24 contribution of poultry in comparison to cattle as a
25 source in your affidavit, sir? 11:09AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I do not believe that I do.

2 Q Okay. I didn't see it either, and that's why
3 I asked the question. I'm just trying to make sure
4 you don't have an opinion that I haven't solicited
5 from my questions regarding relative contribution. 11:09AM

6 Sir, I assume in light of the exchange we just had,
7 that you cannot provide me with an opinion as to the
8 percentage of bacteria either in surface water or in
9 groundwater that you believe originated from poultry
10 litter? 11:10AM

11 A I would not be offering that opinion.

12 Q All right. Now, let me move to your
13 understanding of the opinions of others, Olsen and
14 Harwood. Is it your understanding that both or
15 either of those experts are going to offer a 11:10AM
16 percentage of bacteria that originated from poultry
17 litter as part of their testimony in this case?

18 MR. PAGE: Object to the form.

19 A I would suggest that when you depose them, you
20 ask them because I don't know. 11:10AM

21 Q You don't know whether they are going to offer
22 that opinion or not?

23 A That's correct.

24 Q Okay. Have either of the two of them told you
25 that, their belief as to how much of the bacteria 11:10AM

TULSA FREELANCE REPORTERS
918-587-2878

1 found in Tenkiller, the Illinois River, groundwater
2 or any other water body originates from poultry
3 litter?

4 A In a quantitative sense?

5 Q Yes, sir. 11:11AM

6 A No, I have not had that discussion.

7 Q Sir, I understand from some other depositions
8 that have been taken in this case that there have
9 been some presentations given by the experts

10 retained by the attorney general in recent weeks to 11:11AM

11 various state officials who were being deposed in
12 the case. Are you aware of those meetings?

13 A Yes.

14 Q Did you participate in any of those meetings?

15 A I did. 11:11AM

16 Q Okay. Who did you meet with?

17 A Gosh. There was one meeting. It occurred
18 seven days ago, last Wednesday, in Oklahoma City at
19 the meeting room at the Oklahoma Water Resources
20 Board, and as to attendees, I could only give you a 11:11AM
21 partial list. So that would be --

22 Q Tell me who you recall, and I understand it's
23 limited by your recollection.

24 A Limited list, let's see, attorney general, Mr.

25 Edmondson, Kelly Burch, Mr. Page, let me see, Mr. 11:12AM

TULSA FREELANCE REPORTERS
918-587-2878

1 Butler from the Conservation Commission, Mr. Parrish
2 from the Department of Agriculture, Mr. Smithee from
3 the Oklahoma Water Resources Board. I don't recall
4 but there were two representatives from the
5 Department of Health, two ladies; I believe counsel
6 for the Conservation Commission, and then an
7 additional gentleman from Agriculture whose name I
8 don't recall; an additional lady from the
9 Conservation Commission whose name I don't recall,
10 and the Secretary of the Environment, Mr. Tolbert,
11 and an engineer with the DEQ whose name I do not
12 recall, and that's my recollection of those at the
13 meeting.

11:12AM

11:13AM

14 Q Do you recall if one of the ladies from the
15 Conservation Commission whose name escaped you was
16 Shannon Hargitay?

11:13AM

17 A It may have been. I really don't know her
18 name.

19 Q Was there a gentleman from OWRB by the name of
20 Bill Cauthorn present?

11:13AM

21 A It's possible. I don't know.

22 Q What was the purpose of that meeting?

23 A Well, I'm not sure I know the purpose of the
24 meeting. I was asked to present information
25 concerning the affidavit that I had put forward in

11:14AM

TULSA FREELANCE REPORTERS
918-587-2878

1 this case.

2 Q How long did the meeting last?

3 A Well, I don't know how long the meeting lasted
4 because I left prior to its conclusion.

5 Q How long had it gone on before you left? 11:14AM

6 A Boy, howdy. Three or four hours I think
7 total.

8 Q Were there any presenters that you observed
9 other than yourself in terms of information?

10 A Yes. 11:14AM

11 Q Who were the other presenters?

12 A Dr. Olsen and Dr. Teaf.

13 Q And did you observe both the presentation of
14 Dr. Olsen and Dr. Teaf before you left?

15 A Did I sit through them? Yeah. Did I truly 11:15AM
16 observe them? Not really. I was worried about
17 other stuff, but I was there in the room when they
18 were shown.

19 Q Now, you said this meeting that lasted at
20 least three or four hours, part of the purpose was 11:15AM
21 for you to present information regarding your
22 affidavit; correct?

23 A That's correct.

24 Q Did you pass out your affidavit or did you
25 present it in some other format? 11:15AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I presented a PowerPoint show.

2 Q Okay. I assume the PowerPoint was more than
3 just excerpts from your affidavit; it actually had
4 some charts and graphs and slides in it; is that
5 right? 11:15AM

6 A Yeah, there's some slides in it.

7 Q What was the message that you were conveying
8 in your time before the audience?

9 A My time before the audience had to do with
10 really two things. There are a very large number of 11:16AM

11 poultry operations and large poultry population

12 within the Illinois River watershed, and the

13 Illinois River watershed is underlaine by aquifer

14 units that are generally within the Springfield

15 plateau physiographic province, and the shallow 11:16AM

16 aquifer there is generally referred to as the Boone

17 or Boone-St. Joseph, and it is highly fractured and

18 faulted and Karsted, such that there is

19 solution-enhanced vertical pathways for fluid

20 transmission, as well as lateral pathways for fluid 11:16AM

21 transmission developed along bedding plains, and

22 that there is a strong interplay between surface

23 water and fresh water -- I'm sorry, surface water

24 and groundwater within the Boone and the surface

25 waters of the Illinois River watershed. And just 11:17AM

TULSA FREELANCE REPORTERS
918-587-2878

1 sitting here today, that's what I recollect as my
2 transmission, Mr. George.

3 Q Do you recall, Dr. Fisher, if you presented
4 any data in your materials at this meeting?

5 A Yeah. It would have been data that's been 11:17AM
6 produced to you in my production. The data that
7 would have been displayed would be the -- I think
8 the number -- the counties with -- Washington and
9 Benton County have a lot of poultry in them. That
10 would be 2002 agricultural statistics data. I think 11:17AM

11 I actually showed the top ten counties in the U.S.
12 I would have shown I believe a chart that you have
13 that shows the locations of lake cores that were
14 analyzed. I would have shown some charts of animal
15 populations versus chemical constituents within 11:18AM
16 those lake cores, and the chemical constituents in
17 those lake cores is a function of time, both against
18 the function of time.

19 Q Let me stop you there. With regard to that
20 piece, a graphical representation of animal 11:18AM
21 populations versus particular chemical constituents,
22 do you believe you produced the chart that you used
23 in that PowerPoint presentation in your materials
24 provided to Mr. Page that were subsequently provided
25 to me? 11:18AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Yes, sir, I do believe I have.

2 Q What else; what other data?

3 A Now, I -- I'm sorry, and I believe you've

4 also -- you received these as well -- would have --

5 would be a graph showing -- I think the one would be 11:19AM

6 the timing of poultry waste land application within

7 the Oklahoma portion of the Illinois River watershed

8 from records maintained by the Oklahoma Agriculture,

9 Food & Forestry Department. I believe that's true.

10 Q You mean timing in what sense? 11:19AM

11 A Timing in the sense as tons disposed by month

12 within the watershed.

13 Q Okay. Is this analysis that you completed for

14 Dr. Engel?

15 A Yes. 11:19AM

16 Q Okay.

17 A And then there would have also been, I

18 believe, graphs showing the proximity to source for

19 those sources for which we know source of waste and

20 disposal location of waste within Oklahoma as a 11:20AM

21 whole, as well as the same chart for the Illinois

22 River watershed. I believe that's the sum total of

23 the data. There may be other things, but it's my

24 recollection it all was produced to you.

25 Q Okay. The proximity of application to source 11:20AM

TULSA FREELANCE REPORTERS
918-587-2878

1 is also work that you prepared for Dr. Engel?

2 A Yes, it is.

3 Q Okay. I'll tell you, Dr. Fisher, I think I've
4 seen most of what you've described, but what I
5 haven't seen in your materials, and if I'm missing 11:20AM
6 them, I would welcome somebody pointing it out to
7 me, is the chart that shows animal populations in
8 the watershed versus concentrations of particular
9 chemical constituents.

10 A Can I describe what that was in? 11:21AM

11 Q Please.

12 A There was an Excel spreadsheet that I provided
13 to counsel, and that Excel spreadsheet contained
14 data, chemical data, as well as we'll call it
15 geochronological data, the timing, and in addition, 11:21AM
16 sitting behind that spreadsheet -- and animal
17 populations I think as well, and sitting behind that
18 spreadsheet were graphs of those variables. I think
19 it was animals versus time and then the chemical
20 constituency versus time. I think that's right. 11:21AM

21 Q I have seen, Dr. Fisher, your graphs of
22 changes in animal populations. I just have not seen
23 it displayed in direct relationship to changes in
24 chemical constituents. So what I'm going to do with
25 your indulgence over the lunch hour is give you the 11:22AM

TULSA FREELANCE REPORTERS
918-587-2878

1 CD of electronic files that contains the
2 spreadsheets that were produced to me and ask if you
3 could, when we come back from lunch, identify the
4 particular document you are referring to.

5 A Right, and I may have -- well, I'll be happy 11:22AM
6 to do that. I also may have mischaracterized the
7 plot because I don't have -- as I recall, I don't
8 have number of chickens versus chemical
9 constituents. It's number of chickens over time,
10 for example. 11:22AM

11 Q Right, I've seen that.

12 A And then chemical constituents over time.

13 Q I don't think I've seen the last piece.

14 A Okay.

15 Q Let's talk about the field sampling that was 11:22AM
16 conducted by the attorney general's consultants in
17 this case. Are you relying upon the results of
18 environmental samples collected by the attorney
19 general sampling crew?

20 A Yes. 11:22AM

21 Q Okay. What particular types or class of
22 samples are you relying upon, Dr. Fisher, as part of
23 your analysis in connection with the opinions you've
24 offered in support of the preliminary injunction?

25 A We relied upon the groundwater samples, which 11:23AM

TULSA FREELANCE REPORTERS
918-587-2878

1 would include both groundwater wells and springs,
2 surface water samples generally and the so-called
3 high flow station samples would be a part of that,
4 samples that were collected of the lake sediments
5 and in particular cores collected from that lake, 11:23AM
6 Lake Tenkiller, that data, samples of poultry waste
7 demonstrating that bacteria is present in them,
8 samples of field soils demonstrating poultry waste
9 constituents, samples of water which would be a
10 subset of surface waters samples, but we'll identify 11:24AM
11 them specifically. They would be termed edge of
12 field samples, which were samples collected of
13 runoff from fields to which poultry waste had been
14 applied, and if I have omitted something, after the
15 lunch break I will amend the Record to so reflect 11:24AM
16 that omission, but I believe that's the totality.

17 Q Dr. Fisher, as part of gathering up your
18 materials that you considered and relied upon in
19 this case to provide to counsel for production to
20 the other side, did you endeavor to produce lab 11:24AM
21 reports associated with the samples on which you
22 were relying?

23 A I did not. Those were previously produced and
24 as a consequence -- for many of the samples they
25 were previously produced. I believe for groundwater 11:25AM

TULSA FREELANCE REPORTERS
918-587-2878

1 samples in which there was bacteria, I produced a --
2 summaries of those laboratory reports, I mean in the
3 sense, Mr. George, that a laboratory report is a lot
4 more than that. It would have other information
5 associated with those analyses. 11:25AM

6 Q You said for well samples or groundwater
7 samples that contained bacteria, you produced a
8 summary of reports. Were there groundwater samples
9 that did not contain bacteria?

10 A My recollection is there were some. 11:25AM

11 Q Okay, and did you not produce summaries of
12 those particular samples?

13 A These were in my file. They're -- and the
14 entirety of that record is in your file.

15 MR. TUCKER: Could you explain? 11:26AM

16 MR. ELROD: Yeah. I don't understand that.

17 A You have all the groundwater samples, whether
18 they be of groundwaters or springs. These happened
19 to be a set of documents that illustrated to me that
20 bacteria was present in groundwaters. 11:26AM

21 Q Okay.

22 A The fact -- and I believe that there are
23 graphical representations that are -- there are
24 graphical representations in my production that
25 should show -- that do demonstrate there are some 11:26AM

TULSA FREELANCE REPORTERS
918-587-2878

1 samples in which there is no bacteria.

2 Q Let's see if we can make the Record clear.

3 I'm going to hand you, sir, what we've marked as

4 Exhibit No. 4, and it's a pretty lengthy set. I

5 didn't make an enormous number of copies, but I do

11:26AM

6 have a couple of copies, of lab reports that were

7 contained in your file materials that were produced

8 to me, Dr. Fisher.

9 A Yes.

10 Q And the first set that I put together appear

11:27AM

11 to all be lab reports associated with analysis done

12 on groundwater samples.

13 MR. PAGE: Mr. George, may I just inquire,

14 did you say No. 4?

15 (Whereupon, a discussion was held off

16 the Record.)

17 Q Let me hand you what we've remarked as Exhibit

18 No. 5, Dr. Fisher, and those are the lab reports

19 that I was able to find in your materials for

20 analysis done on groundwater. Okay? Do you

11:27AM

21 recognize those documents?

22 A Yes, I do.

23 Q Did you review those documents in preparation

24 of offering the opinions that you've offered in this

25 case?

11:28AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Yes.

2 Q Okay. Did you review any other groundwater
3 sample results beyond those that you had printed in
4 your file?

5 A Yes, I did in a different form. 11:28AM

6 Q Okay. So let me ask this question: Is
7 Exhibit No. 5 in terms of groundwater samples a
8 subset of the overall groundwater sampling data that
9 was made available to you?

10 A I believe it is. 11:28AM

11 Q Okay. How many more samples of groundwater
12 beyond what is in Exhibit No. 5 do you think you had
13 access to?

14 A Gosh, I'll have to count them over lunch break
15 because they're illustrated on the graphical images 11:28AM
16 that have call-outs to groundwater samples. You
17 probably have those with you.

18 Q Dr. Fisher, is this what you are referring to?

19 A Yes.

20 Q Okay. We'll go ahead and mark as Exhibit No. 11:29AM
21 6 a map that was included in your materials that
22 were produced that is entitled Illinois River
23 Watershed 2006 Well Sampling.

24 MR. TUCKER: Did you get the number on
25 that? 11:29AM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. GEORGE: It is Fisher 00003650.

2 MR. TUCKER: 3650?

3 MR. GEORGE: Yes, sir.

4 Q Now, Dr. Fisher, does Exhibit No. 6 reflect
5 all of the well sampling analysis that you consulted 11:30AM
6 as part of your analysis in the case?

7 A These are from 2006, which was the year in
8 which we had a comprehensive set of groundwater well
9 samples. I believe that's what these are.

10 Q Well, let me ask the question more 11:30AM
11 specifically then. Does Exhibit No. 6 to the best
12 of your knowledge, sir, reflect all of the locations
13 at which groundwater wells were sampled in 2006?

14 A Okay. To the best of my recollection, yes.

15 Q Okay. Now, with respect to other years, what 11:30AM
16 other years did the State conduct groundwater
17 sampling as part of its preparations for this case?

18 A Well, including spring sampling, there was
19 some limited spring sampling conducted in 2005, and
20 I believe there was spring and some groundwater 11:31AM
21 sampling collected in 2007.

22 Q When you say groundwater, are you referring to
23 residential well samples or something else?

24 A Right. To make that clear, groundwater would
25 be -- we should probably refer to it as well 11:31AM

TULSA FREELANCE REPORTERS
918-587-2878

1 sampling and spring sampling, but they're both of
2 groundwater.

3 Q Were there wells sampled in 2006 -- I'm sorry,
4 in 2007 for bacteria?

5 A I believe there were. 11:31AM

6 Q Okay, and have you produced the results of
7 those lab analysis as part of your production in
8 this case?

9 A I have not.

10 Q Have you reviewed and relied upon the results 11:32AM
11 of well samples taken in 2007 as a foundation for
12 any of the opinions that you intend to offer in
13 support of the preliminary injunction motion?

14 A I don't believe so.

15 Q Okay. Is there a reason you did not rely on 11:32AM
16 the 2007 well sampling data?

17 A I'm not sure I've had the opportunity to
18 review it completely, and I'm not sure that it
19 actually may -- it may not have been complete but
20 I'm not sure. 11:32AM

21 Q Okay. Now, prior to 2006, are you aware of
22 any well sampling conducted for bacteria by the
23 attorney general's consultants?

24 A Not as we sit here, no, sir.

25 Q Okay. All right. So I've counted from your 11:32AM

TULSA FREELANCE REPORTERS
918-587-2878

1 map as Exhibit No. 6 that it appears there are
2 approximately 41 locations where wells were sampled
3 for bacteria; is that roughly consistent with your
4 memory?

5 A I'll tell you, what I'm seeing here is this is 11:33AM
6 representing a snapshot of 2006 wells, and I'm
7 not -- I can't tell you how many. That sounds about
8 right, but there have been an awful lot of samples
9 collected. So I'm looking at the 2006 samples. I
10 believe these are all of them, but they may not 11:33AM
11 include everything that's in here; it may not.

12 Q Is there any reason, sir, that you can think
13 of why you would not have displayed 2006 well
14 samples on Exhibit No. 6 if you had a lab report for
15 them? 11:33AM

16 A Well, I would have looked at the lab report,
17 and this was generated in an earlier time. It
18 wasn't generated specifically for this affidavit.

19 Q Okay. In looking at either the -- well, let's
20 start with Exhibit No. 6. In looking at Exhibit No. 11:34AM
21 6, which of the wells can you identify as being
22 contaminated with fecal bacteria?

23 A Okay.

24 Q And I'd ask you to put an X on the ones that
25 in your scientific opinion are contaminated with 11:34AM

TULSA FREELANCE REPORTERS
918-587-2878

1 fecal bacteria.

2 A Okay, and I would define being contaminated
3 with fecal bacteria as having any positive fecal
4 bacteria count.

5 Q Okay. Let me ask a follow-up question before 11:34AM
6 we mark on the document then. How would you treat
7 non-detects or below detection limits in that
8 analysis?

9 A They would be treated as a less than value,
10 which would be an arrow pointed to the left. 11:34AM

11 Q Okay. Well, if you get a less than the
12 detection limit value for fecal coliforms, do you
13 consider that to be evidence of contamination or
14 not?

15 A I would consider that to be evidence that they 11:35AM
16 weren't detected.

17 Q Okay. Well, then let's refine my question,
18 and I appreciate the exchange. Could you put an X
19 on all of the wells on Exhibit No. 6 where there
20 have been detections of fecal coliform above the 11:35AM
21 detection limits?

22 A Yes.

23 Q By the way, while you are doing that, Dr.
24 Fisher, what abbreviation are you referring to for
25 the fecal coliform count? 11:35AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Capital F, capital C, a lowercase F.

2 Q Thank you.

3 MR. ELROD: Is that the bottom most number
4 on these boxes?

5 A It should be, Mr. Elrod. 11:36AM

6 Q While you're marking, do you mind if I ask a
7 question while you are going, Dr. Fisher; would that
8 distract you?

9 MR. PAGE: Could we wait on him to finish?

10 MR. GEORGE: Okay. 11:36AM

11 MR. PAGE: Thank you.

12 A I believe I'm done.

13 Q Okay. How many X's did you make, Dr. Fisher?

14 A Nine.

15 Q Nine? 11:37AM

16 A Uh-huh.

17 Q Okay, and --

18 A On this diagram.

19 Q Let me see your diagram. Sir, you included in
20 your count of nine wells a few wells -- looks to me 11:37AM
21 to be four wells that had fecal coliform detections
22 of two, which is the detection limit; correct?

23 A They're reported as detects, so that would be
24 reported as a contaminated well.

25 Q Okay. So, sir, do I -- would I understand 11:38AM

TULSA FREELANCE REPORTERS
918-587-2878

1 correctly then from the exercise we've just gone
2 through, that out of the 41 or so, and we can count
3 them all if we need to but I think it's 41. Out of
4 the 41 wells that were sampled in 2006, only eight
5 of them included results where fecal coliforms were 11:38AM
6 detected?

7 A I think as we look at this diagram, it's true,
8 and if you would give me a moment, I'll review
9 these.

10 Q Well, let me say this: I mean, you are 11:38AM
11 welcome to review them, Dr. Fisher, but I have not
12 matched up those lab reports to this map, so I don't
13 know if they're exactly the same universe. That's
14 the issue.

15 A Well, I understand that. 11:38AM

16 Q If you want to compare them, you can, but I
17 didn't want you to be misled about what those are
18 because I don't know what they are to be honest with
19 you.

20 MR. ELROD: Let me see the exhibit that's 11:39AM
21 marked.

22 MR. GEORGE: The map?

23 MR. ELROD: Yeah.

24 Q While you're looking through those, the
25 documents that are Exhibit No. 5, Dr. Fisher -- 11:39AM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Uh-huh.

2 Q -- could you identify any wells in which --

3 MR. PAGE: Could we just have one question
4 on at a time since he's doing some work to respond
5 to your last question? 11:39AM

6 MR. GEORGE: Oh, I didn't think he was
7 responding. I didn't think I had a question on the
8 table to be honest with you.

9 Q Dr. Fisher, what are you reviewing Exhibit 5
10 for at the moment? 11:39AM

11 MR. BULLOCK: Counsel, let's focus on this.

12 MR. McDANIEL: Are you being the assistant
13 principal in here?

14 MR. BULLOCK: Well, I couldn't hear the
15 question for the chatter going on. 11:39AM

16 MR. McDANIEL: I'm sorry, Mr. Bullock.

17 MR. BULLOCK: I am, too.

18 MR. GEORGE: Are you all done?

19 MR. ELROD: You all are starting to sound
20 like Hillary and Barack. 11:40AM

21 Q Dr. Fisher, you are reviewing the lab reports
22 in Exhibit No. 5; correct?

23 A Yes, I am.

24 Q Okay. What are you reviewing those for?

25 A I'm reviewing them for the same things I 11:40AM

TULSA FREELANCE REPORTERS
918-587-2878

1 reviewed the diagram for.

2 Q To see if you can identify the same number of
3 detected fecal coliform incidences?

4 A That's correct.

5 Q Okay. While you are looking, sir, if you're 11:40AM
6 able to, and if you're not, tell me, I'd like for
7 you to identify any wells where you detected the
8 presence of either Campylobacter or Salmonella.

9 A Okay. That one is going to require looking at
10 the information in more detail than I can do in ten 11:40AM
11 seconds.

12 Q I'll give you as much time as you need.

13 A Okay. Well, that's great.

14 MR. GEORGE: Can we go off the Record?

15 MR. ELROD: Yeah. 11:41AM

16 VIDEOGRAPHER: We're off the Record. The
17 time is 11:41 a.m.

18 (Following a short recess at 11:41
19 a.m., proceedings continued on the Record at 12:01
20 p.m.) 12:01PM

21 VIDEOGRAPHER: We are now on the Record.
22 The time is 12:01 p.m.

23 MR. PAGE: I'd like to note for the Record
24 that Dr. Fisher was performing work in response to
25 your inquiry so the time he spent should be 12:01PM

TULSA FREELANCE REPORTERS
918-587-2878

1 allocated towards his total time as a witness today.

2 MR. GEORGE: I'm not going to respond to
3 that. We'll see if it's necessary at the end of the
4 day, but let's keep going.

5 Q Dr. Fisher, now that you've had an opportunity 12:01PM
6 to review the lab reports from which I think Exhibit
7 3 -- I'm sorry, Exhibit 6 was created, have you come
8 to a different conclusion as to the number of wells
9 from the 2006 sampling where the fecal coliform
10 bacteria was detected? 12:02PM

11 MR. PAGE: Object to the form.

12 A Okay. I believe I have, and I would -- the
13 issue here is I need to subtract springs. I didn't
14 think about subtracting springs when we started, and
15 I hate to drag you back through that. 12:02PM

16 Q Well, let me ask a clarifying question. Was
17 there some spring reports in Exhibit 6?

18 A Yes.

19 Q All right. I intended to pull those out.
20 Apparently I made a mistake on my part. I wanted to 12:02PM
21 discuss springs separately with you.

22 MR. PAGE: You said Exhibit No. 6. I'm not
23 sure if you meant --

24 MR. GEORGE: Exhibit 5. Thank you, David.
25 Exhibit 5. 12:02PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. So you've added up all of Exhibit No. 5
2 in terms of fecal coliform, whether they were
3 springs or wells?

4 A Right. I've looked at those samples that
5 contain no bacterial detections, those samples that 12:02PM
6 contain total coliform detections, those samples of
7 groundwater, whether it be springs or wells, with
8 fecal coliform detections, E. coli detections, and
9 Terracoccus detections, Salmonella detections and
10 Staphylococcus detections. 12:03PM

11 Q Okay. Let me ask a couple of specific
12 questions then. From your review of the lab reports
13 that comprise Exhibit No. 5, how many wells, and I
14 guess if there's a spring in there, springs, were
15 there fecal coliform bacteria detected? 12:03PM

16 MR. PAGE: Object to the form.

17 A There are 13 fecal coliform detections.

18 Q And how many instances in the lab reports that
19 were put in front of you as Exhibit No. 5, which
20 came from your materials produced in the case, did 12:03PM
21 the State's sampling detect the presence of
22 Campylobacter?

23 A I'm not sure that Campylobacter is reported as
24 an analyte. I'm not sure it was analyzed for in
25 these records. 12:04PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Given that, sir, are you aware of any instance
2 in which either in a residential well or a spring
3 the sampling conducted by the State confirmed the
4 presence of Campylobacter?

5 A I can't recall. 12:04PM

6 MR. ELROD: But for this, there is none?

7 MR. GEORGE: Right.

8 Q From the records in front of you, you cannot
9 determine the presence of Campylobacter in any of
10 the wells or springs that are reflected in the 12:04PM
11 sampling in Exhibit No. 5?

12 A That's correct.

13 Q Okay. Now, Dr. Fisher, with regard to
14 Salmonella, in how many instances in the lab reports
15 that comprise Exhibit No. 5 were there detections 12:04PM
16 for Salmonella?

17 A Two.

18 Q Two out of a total of how many reports?

19 A I believe there are a total of 42 samples.

20 Q Can you find the two that had Salmonella, and 12:04PM
21 I'm wondering if they are springs or groundwater?

22 A Well, they're all groundwater.

23 Q Well, springs or wells?

24 MR. ELROD: What's the question on the
25 table? 12:08PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. GEORGE: If he could identify the two
2 lab reports that show Salmonella.

3 A Would you like to go off the Record briefly?

4 Q I'd like to see if you can first answer my
5 question on the Record? Did you find the two 12:10PM
6 reports where you indicated there was the presence
7 of Salmonella?

8 A I have found one of the reports.

9 Q Okay. Let me see the one, please. For the
10 Record, it's Station ID GW6, Bates number 5471. How 12:10PM
11 much Salmonella was detected in the Well GW6?

12 A This there were two MPN per hundred mils --

13 Q What --

14 A -- detected.

15 Q I'm sorry. I didn't mean to interrupt you. 12:10PM
16 What is MPN?

17 A It's a colony-forming unit. It's a most
18 probable number. It's in terms of colony-forming
19 units per hundred mils.

20 Q Other than that one exception, sir, in the lab 12:11PM
21 reports that are in front of you, would it be
22 correct for me to state that the State's sampling
23 did not detect Salmonella in wells?

24 MR. PAGE: Object to the form.

25 A From my review of these records, there are two 12:11PM

TULSA FREELANCE REPORTERS
918-587-2878

1 detections.

2 Q Okay, but you can't find the other one at this
3 moment?

4 A I can go through these records again. I doubt
5 you wish me to do that. 12:11PM

6 Q I do not, sir. I think we've gone through
7 them at some depth. So as we sit here at this
8 moment, without extended review, and the records
9 will show whatever they show, I don't think we have
10 a quarrel on that, you can only identify one well in 12:11PM
11 which Salmonella was detected as a result of all the
12 sampling done by the State of Oklahoma's
13 consultants?

14 MR. PAGE: Object to the form.

15 Q Is that true? 12:11PM

16 A Within the second pass through these records,
17 there is one well that I have identified here.

18 Q Okay.

19 A And the records will show what they show.

20 Q As we sit here today, sir, do you have 12:12PM
21 knowledge of any other well that has Salmonella
22 detected in it?

23 A Other than the two records in this pile, no.

24 Q Well, the two records you think are in that
25 pile; correct? 12:12PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I saw them both. I saw them at separate
2 times. I know they're in that pile.

3 Q Okay. Can you bundle back up Exhibit 5 so it
4 doesn't get intermingled with what I'm going to hand
5 you next? 12:12PM

6 A (Witness complied).

7 MR. ELROD: Before you leave that, would it
8 be easy for you to put on your map the Salmonella
9 well?

10 Q Could you mark that on Exhibit 6, the one well 12:12PM
11 that you have confirmed from the lab report the
12 detection of Salmonella?

13 MR. PAGE: Object to the form.

14 A I'm not sure. It would be easy for me to map.
15 I'm not sure I can put it on this map with any 12:12PM
16 certainty because of the way these are identified.

17 Q The station number is not the same on your map
18 compared to the lab report; is that what you're
19 saying?

20 A It may not be. I don't want to mislead you by 12:13PM
21 giving you the wrong piece. I would be happy to do
22 this and provide it to you as soon as possible.

23 MR. PAGE: I'm going to object to the form
24 again, this whole line of questioning comparing
25 Exhibit 5 with No. 6. 12:13PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I'm sorry. I can identify that well.

2 Q Could you circle it, please?

3 A (Witness complied).

4 Q Let me hand you what we'll mark as Exhibit No.

5 7 to your deposition. Sir, Exhibit 7 are lab 12:13PM

6 reports that were included in your materials that

7 were produced in this case related to spring

8 sampling and if, as you identified earlier, I

9 included the spring sample in the prior set, I

10 apologize, but these are the balance of all spring 12:14PM

11 samples I've been able to identify. Do you

12 recognize Exhibit No. 7?

13 A Yes, I do.

14 Q And did you rely upon the reports that are

15 reflected in Exhibit No. 7 as part of the basis for 12:14PM

16 your opinions in this case?

17 A I did.

18 Q Did you observe any spring sampling?

19 A It was conducted under my direction. I did

20 not directly observe it as I recall. 12:14PM

21 Q Well, did you observe it indirectly? I'm

22 confused by that statement.

23 A I saw photographs of spring sampling.

24 Q You were not present when any of the samples

25 were actually collected; correct? 12:14PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A No.

2 Q Okay. Tell me what a spring is.

3 A Well, a spring is a location where groundwater
4 that is beneath the surface comes to the surface.

5 So it's the interception of either a permanent -- 12:15PM
6 some water table, whether it be perched water or
7 whether it be a permanent groundwater table
8 intersecting the surface.

9 Q Okay, and it's surfacing water; is that fair?

10 A That's fair. 12:15PM

11 Q Okay, and it derives from an underground
12 source, but it ultimately presents itself on the
13 surface of the land; is that correct?

14 A Well, everything actually derives from a
15 meteoric source or it comes from rainwater. 12:15PM

16 Q I thought I said underground source?

17 A You did say.

18 Q Okay.

19 A So I would disagree that it comes from an
20 underground source. Its proximate source is 12:15PM
21 underground.

22 Q Okay. With respect to the physical place at
23 which a spring sample was taken, do you know with
24 regard to Exhibit No. 7 whether the sample was
25 procured before the water came out of the ground or 12:15PM

TULSA FREELANCE REPORTERS
918-587-2878

1 after?

2 A It would -- they would have been collected as
3 near the source as possible.

4 Q Okay. Do you know the extent to which the
5 properties that were sampled in terms of springs on 12:16PM
6 Exhibit No. 7, whether any of the source location
7 from where the spring surfaced was actually on a
8 separate piece of property and the stream or the
9 spring just ran through that property?

10 A It's possible. 12:16PM

11 Q Okay. So for purposes of a spring sample as
12 defined as part of the work in this case, it could
13 be water running through a stream that originates on
14 an entirely different property; correct?

15 MR. PAGE: Object to the form. 12:16PM

16 A Yeah. I don't know -- specifically there may
17 have been one instance in which there was a stream
18 exiting a property.

19 Q Okay. Well, what instructions were given to
20 the sampling crew in terms of how close to the 12:16PM
21 source to get and how to take a sample that would
22 ensure that it's reflective of groundwater as
23 opposed to surface water?

24 A Okay. That would be contained within the
25 protocol for spring sampling. 12:16PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. Do you have a command or memory of that
2 particular part of the protocol as we sit here
3 today?

4 A I have a recollection that the instruction is
5 to get as near the source as possible. 12:17PM

6 Q Okay. Do you recognize, sir, that depending
7 upon where the actual samples were taken in
8 reference to the actual source, that the data
9 reflected in the spring sampling set could indeed
10 reflect the influences of surface contamination? 12:17PM

11 A It's possible.

12 Q Okay. What have you done to exclude that
13 possibility from your analysis?

14 A We used the sampling protocol to the extent
15 that we have reports in the field books that I've 12:17PM
16 looked at, individual eyewitness accounts of the
17 sampling, photographs of the sampling.

18 Q Okay. Have you gone back and verified,
19 though, that there's no influence of surface
20 contamination within the data that was collected and 12:17PM
21 is described as spring samples?

22 MR. PAGE: Object to the form.

23 A See, given the care exercised in sampling, it
24 would be my belief that we have minimized or
25 eliminated any surface contamination. 12:18PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. Can you point me to anything empirical
2 to establish that or is it just your belief?

3 A I would point to the field notes.

4 Q You think the field notes will tell me whether
5 they collected it two foot from the source of the 12:18PM
6 spring or twenty foot from the source of the spring?

7 A They should.

8 Q Okay. What, if anything, do you know, sir,
9 about the access of other animals to the springs
10 that were sampled that are reflected in Exhibit No. 12:18PM
11 7?

12 A There may be an instance in which there is
13 access of cattle to a spring.

14 Q Which instance would that be?

15 A I don't know as we sit here today. 12:18PM

16 Q Can you state confidently that there's only
17 one instance in which a sample was taken from a
18 spring to which cattle had access?

19 A I can state confidently that all care was
20 taken to minimize the influence of surface 12:19PM
21 contamination.

22 Q Well, were the sampling crews instructed to
23 not sample on a field where a spring surfaced if
24 cattle had access to that field?

25 A No. They were indicated to annotate that in 12:19PM

TULSA FREELANCE REPORTERS
918-587-2878

1 their field notes.

2 Q Okay.

3 MR. GEORGE: Let's stop there.

4 VIDEOGRAPHER: We are off the Record. The

5 time is 12:19 p.m. 12:19PM

6 (Following a lunch recess at 12:19

7 p.m., proceedings continued on the Record at 1:26

8 p.m.)

9 VIDEOGRAPHER: We are back on the Record.

10 The time is 1:27 p.m. 01:26PM

11 Q Dr. Fisher, before we took our break, we were

12 talking about the possibility of surface

13 contamination in the area in which springs were

14 sampled. Do you recall that discussion?

15 A Yes. 01:27PM

16 Q Okay. Sir, did you exclude any spring-sampled

17 result from your analysis in this case based upon a

18 determination that there was surface contamination

19 in the area in which that sample was collected?

20 A No. 01:27PM

21 Q Okay. Would it have been your responsibility

22 to have reviewed the data and the information

23 available to make a determination as to whether a

24 spring sample should be excluded from the analysis?

25 A Yes, it would be. 01:27PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay, and what steps, if any, did you take to
2 make the determination that all of the spring
3 samples that you used in your analysis were not
4 subject to surface contamination?

5 A Viewed the field notebooks, interviewed the 01:27PM
6 samplers, reviewed any photographs taken of the
7 springs and environments.

8 Q Did you ask the field personnel with respect
9 to each sample what they knew about the access of
10 cattle to those properties? 01:28PM

11 A No.

12 Q I'll try to tie up the spring and --

13 A And let me amend that answer by saying that
14 access of cattle to a property is fairly obvious
15 from trail marks and so on, so that would be evident 01:28PM
16 in the photographs, and they did call -- they were
17 called to my attention if there were animals in the
18 area.

19 Q And no one ever called to your attention the
20 fact that there might be animals in the area in 01:28PM
21 which spring samples were collected?

22 A No, no. They collected the samples as close
23 to the origin as possible.

24 Q What does that tell you about whether a cow
25 was right there at that origin the day before? 01:28PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Well, given the fact that there didn't seem to
2 be any cattle fecal matter sitting in the spring,
3 then it would not be obvious that a cow had been
4 there one day before.

5 Q Could a cow have been there and it just not be 01:29PM
6 obvious?

7 A I don't know.

8 Q Okay. Sir, can you identify a residential
9 well or spring which contains fecal bacteria at a
10 level that you believe presents a substantial and 01:29PM
11 imminent threat to human health?

12 MR. PAGE: Object to the form.

13 A I'm not an expert in making that assessment,
14 so I'm not going to make that assessment.

15 Q Okay. So you do not have an opinion one way 01:29PM
16 or the other as to whether the level of bacteria
17 found in any of the wells or springs that you have
18 lab reports on presents a substantial and imminent
19 threat to human health?

20 A Aside from saying that finding any fecally 01:29PM
21 related bacteria in a sample of groundwater is of
22 concern, no.

23 Q What's your basis for that statement, that
24 finding any is of concern?

25 A Well, if I can avoid drinking fecal material, 01:29PM

TULSA FREELANCE REPORTERS
918-587-2878

1 I generally do.

2 Q Okay, but you're not a medical doctor;
3 correct?

4 A I am not a medical doctor.

5 Q Nor a toxicologist? 01:30PM

6 A Nor a toxicologist.

7 Q Can you identify any well or spring that
8 contains Campylobacter or Salmonella at a level that
9 you believe presents substantial and imminent
10 threats to human health? 01:30PM

11 MR. PAGE: Object to the form.

12 A That would be the same answer. I'm not an
13 expert in that matter, but I would not drink water
14 from a spring that contained Campylobacter.

15 Q Are you relying at all, sir, upon groundwater 01:30PM
16 samples collected through geoprobes?

17 A Yes.

18 Q What is a geoprobe?

19 A A geoprobe is a device that uses what's
20 generally termed direct push technology. It pushes 01:30PM
21 down from the surface a probe and then collects
22 water through that probe. Generally it's used in
23 unconsolidated material. So it would be shallow
24 soils or in alluvial aquifers.

25 Q With respect to the well samples that are 01:31PM

TULSA FREELANCE REPORTERS
918-587-2878

1 shown on Exhibit No. I think it's 6, the map, are
2 any of those samples that were collected through a
3 geoprobe?

4 A No. All the geoprobe samples and data that
5 would pertain thereto have been previously produced 01:31PM
6 to you and were incorporated in my production as an
7 index with specific Bates numbers given to the -- to
8 that analytical data as it exists, and that would
9 apply to groundwater samples, spring samples.

10 Anything that we don't have a record of here, it's 01:31PM
11 already been produced to you.

12 Q What is the range of depths from which the
13 State's consultants collected water through geoprobe
14 sampling in the Illinois River watershed?

15 A As I sit here, I can't remember. They're 01:31PM
16 shallow. They would be generally less than 30 feet.

17 Q Have you seen the reports that show the depths
18 at which those samples were collected?

19 A I know I have. I just don't recall anything
20 beyond shallow. 01:32PM

21 Q I had some confusion, and I'm hoping you could
22 clarify it for me, as to whether those were reported
23 in feet or meters or centimeters or inches; do you
24 know?

25 A If you have one, I'll look. 01:32PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q I don't have one handy. Okay. You said that
2 they were generally below or shallower than 30 feet.
3 What would be the average depth?

4 A I don't know.

5 Q What, if anything, does a water sample 01:32PM
6 collected from six feet below the surface tell you
7 about the condition of groundwater that may be
8 consumed?

9 A Well, it tells you that there's a risk. You
10 know, the Oklahoma Water Resources Board has defined 01:32PM
11 the Boone aquifer as a high-risk bedrock aquifer
12 and, in fact, it is a risk level only slightly less
13 than the risk level assigned to alluvial aquifers.
14 So if you are looking at water in the shallow
15 subsurface, that's in part how water gets into the 01:33PM
16 deeper subsurface. So that shows you that there is
17 a path, some sort of meaningful path, from the
18 surface to that depth.

19 Q Is it your testimony, sir, in this case that
20 the values reflected in geoprobe sampling are 01:33PM
21 reflective of what northeast Oklahomans are actually
22 consuming from their residential wells?

23 A No.

24 Q Okay. The wells are considerably deeper than
25 where you were able to sample with geoprobes; would 01:33PM

TULSA FREELANCE REPORTERS
918-587-2878

1 you agree?

2 A Right, but depth of the well is not the entire
3 story. As in one of the -- in the report that you
4 provided me, I think from MacDonald, Jeffus, Steele,
5 Coughlin, Kerr and Wagner, which is Exhibit No. 3,
6 among the -- their hypotheses concerning
7 contamination of these off-linear wells with
8 bacteria had to do with lack of sufficient casing in
9 the well. So in that instance, very shallow
10 contamination, very shallow groundwater
11 contamination can be highly significant if the
12 casing is not properly installed.

01:33PM

01:34PM

13 Q How many of the wells in northeast Oklahoma
14 are improperly cased?

15 A There's no way to know that. There are --
16 within the Illinois River watershed I believe, when
17 the Oklahoma Water Resources Board database was
18 looked at, there were 1,771 wells, domestic wells.
19 Of those, about 20 percent are completed to less
20 than 150 feet. Because -- that's about right. That
21 may actually include Arkansas wells, too, but it
22 probably would be about the same across the board.
23 Because that registry of wells in Oklahoma is of
24 relatively recent vintage from the 1980's, there are
25 hundreds certainly of wells, older wells that are

01:34PM

01:34PM

01:35PM

TULSA FREELANCE REPORTERS
918-587-2878

1 out in the landscape that are quite shallow.

2 Q Have you identified a single well in northeast
3 Oklahoma that is completed to a depth shallower than
4 30 feet?

5 A I don't believe so, but I'd have to review the 01:35PM
6 records and, again, it's a little misleading to talk
7 about completion depth. That assumes that the
8 casing is properly installed.

9 Q Well, are you assuming it's not properly
10 installed? 01:35PM

11 A I think that you have to be -- the reality is
12 that frequently older wells have either degraded or
13 were never properly installed.

14 Q Okay. Have you done any sort of statistical
15 analysis as to the failure rate of wells in 01:35PM
16 northeast Oklahoma?

17 A I have not.

18 Q Okay. Have you done any sort of statistical
19 analysis or review to determine the extent to which
20 wells in northeast Oklahoma are improperly cased? 01:36PM

21 A I have not.

22 Q Now, out of the -- did you say 1,717?

23 A No. 1,771 if I recall correctly.

24 Q Out of the 1,771 wells registered in northeast
25 Oklahoma that you've identified in this watershed I 01:36PM

TULSA FREELANCE REPORTERS
918-587-2878

1 think, how many of those are actually being used
2 today for furnishing domestic potable water?

3 A 98 percent of those wells are classed as
4 domestic wells.

5 Q Okay. Well, that wasn't entirely my question. 01:36PM
6 How many of them are still being used today for that
7 purpose?

8 A I do not know.

9 Q Okay. You'll agree with me on that list of
10 wells, many of which were constructed decades ago, 01:36PM
11 there's a high probability that some of those
12 homeowners have since gone to city water or rural
13 water?

14 MR. PAGE: Object to the form.

15 A I've not made that study. 01:36PM

16 Q Okay. So you cannot say with any confidence
17 the number of wells that are actually being used for
18 domestic water in the Illinois River watershed
19 today?

20 MR. PAGE: Object to the form. 01:37PM

21 A I would say that the majority of operational
22 wells are being used for domestic water supply, one,
23 and, number two, a substantial reason for abandoning
24 use of a well is its contamination.

25 Q Are you aware of anyone in the Illinois River 01:37PM

TULSA FREELANCE REPORTERS
918-587-2878

1 watershed that has abandoned use of their well due
2 to concern about bacteria?

3 A Not as I sit here today.

4 Q Okay. You said a majority, in your belief,
5 are still being used to furnish domestic water. 01:37PM

6 Does that mean more than 50 percent?

7 A Yes.

8 Q Okay. How much more than 50 percent?

9 A I don't know.

10 Q What's your basis for that 50 percent? 01:37PM

11 A Well, there are a large number of folks out in
12 the Illinois River watershed living in rural areas
13 that depend upon their wells for their potable water
14 supply.

15 Q Have you surveyed well owners in the 01:38PM
16 watershed?

17 A You mean surveyed them in what sense?

18 Q Knocking on their door and asking them, ma'am,
19 sir, do you still use your well for drinking water?

20 A No. We've asked them if we could sample their 01:38PM
21 well.

22 Q How many -- how many have you spoken to?

23 A Personally?

24 Q Let's start with that.

25 A None personally. 01:38PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. People on your behalf, how many well
2 owners have people working for you spoken with?

3 A I'm going to estimate on the order of 200.

4 Q Were you turned away by some in terms of your
5 request for sampling of their wells?

01:38PM

6 A Yes.

7 Q Okay. So I mean, for example, we had 40 some
8 odd wells in front of us earlier. Do you think the
9 rejection rate on those inquiries was that high?

10 A I do.

01:38PM

11 Q 40 out of 200?

12 A I do.

13 Q Okay. Did you explain to those folks that you
14 were there on behalf of the State of Oklahoma?

15 A The reasons for rejection are multitudinous,

01:39PM

16 A, did we explain what we were doing that for? Yes.

17 Q Well, my question was, did you explain to them
18 that you were there on behalf of the State of
19 Oklahoma?

20 A Yes.

01:39PM

21 Q Okay, and some of those folks still didn't
22 want their well tested by you or people working on
23 your behalf?

24 A Yes, and some of those folks weren't home to
25 be asked either.

01:39PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. So if you knocked on the door and no
2 one answered, that was a rejection for purpose of
3 answering the question?

4 A Well, yes.

5 Q Okay. Do you have your affidavit in front of 01:39PM
6 you, sir?

7 A I do.

8 Q Actually perhaps before we get to the
9 affidavit, over the lunch hour did you have a chance
10 to look at the electronic files on the CD? 01:39PM

11 A I did.

12 Q And did you find the document we were talking
13 about earlier?

14 A I did.

15 Q And do you have a reference for me? 01:40PM

16 A I do.

17 Q Please provide that.

18 A Okay. In the directory on here that's called
19 XLS, these files seem to be organized by file
20 extension. There is an Excel spreadsheet that is 01:40PM
21 called livestock and chemistry. That spreadsheet
22 contains the data as to the age of sections of the
23 core and depth, the chemical data summarized for
24 those sediments and in parallel to that, the numbers
25 of various livestock elements that are estimated 01:40PM

TULSA FREELANCE REPORTERS
918-587-2878

1 based on the agricultural census that was described
2 earlier.

3 Q Okay. Thank you. I will find that sometime
4 through the afternoon and look at it, and I'll have
5 some questions based on that. I appreciate your 01:41PM
6 help in locating it. Sir, in your affidavit and on
7 Page 4, I believe it's Paragraph 5 --

8 A I do need to amend that answer a little bit in
9 that the data that sits behind those summaries was
10 also produced to you either in its entirety, that 01:41PM
11 is, would be the geochronological data from DePauw
12 University, okay, or incorporated by reference with
13 big Bates number reference in documents already
14 produced to you in analytical reports.

15 Q Okay, but the document that I'm going to see 01:41PM
16 has a summary of that data; correct?

17 A It has a summary of the numerical data, yes.

18 Q And it summarizes the constituent
19 concentrations?

20 A It does. 01:41PM

21 MR. McDANIEL: Can I clarify because I'm
22 trying to -- did you say the spreadsheet is called
23 livestock and chemistry?

24 A Yes.

25 MR. McDANIEL: And how would you locate the 01:42PM

TULSA FREELANCE REPORTERS
918-587-2878

1 charts? I see one folder that's called core
2 chemistry.

3 A Oh, meaning you're looking for charts. All
4 the data has been produced. I was pretty thoroughly
5 convinced that I produced a chart but apparently I 01:42PM
6 didn't. I gave you the data.

7 Q Okay. Well, let's clear the Record up because
8 it is muddled at the moment in my estimation. You
9 have pointed me to a spreadsheet that has some
10 chemistry data associated with your sediment 01:42PM
11 sampling; correct?

12 A Yes, that's correct.

13 Q Okay. You have created as part of your work
14 in this case some charts that plot that data
15 alongside the changes in population of cattle and 01:42PM
16 poultry and other animals; correct?

17 A Yes, I have.

18 Q Okay, but what you referred me to on the CD
19 does not actually graphically show that?

20 A No, it does not, but you could say it's in its 01:43PM
21 native state and you could prepare a graph from
22 that.

23 Q Okay, but you've already prepared one; right?

24 A Yes.

25 Q It just didn't get produced? 01:43PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Somehow it did not.

2 MR. GEORGE: David, I'm going to ask for
3 the production of that document.

4 MR. PAGE: Sure, absolutely.

5 Q All right. Back to your affidavit -- thank 01:43PM
6 you, Dr. Fisher. Page 4, Paragraph 5 you make a
7 reference, and this may not be the only reference in
8 your affidavit, but it's just the first line I
9 flagged, to report by investigators; do you see
10 that? 01:43PM

11 A Yes, I do.

12 Q Okay, and to your direct observations; do you
13 see that as well?

14 A I do.

15 Q Okay, and the subject matter of Paragraph 5 is 01:43PM
16 significant amounts of poultry waste have been land
17 applied in the watershed by each of the defendants;
18 right?

19 A Correct.

20 Q Okay. So, sir, did you directly observe any 01:43PM
21 of the companies named in this lawsuit land applying
22 poultry litter in the watershed?

23 A I directly -- let's see. I believe I
24 observed -- well, I have observed land application,
25 and as I sit here today, I'm not sure I've observed 01:44PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the specific company doing it, although I may have.

2 Q Okay. Let me break it down. Have you
3 observed my client, Tyson Foods, Tyson Chicken,
4 Tyson Poultry or Cobb-Vantress, land applying
5 poultry litter in the watershed? 01:44PM

6 A I may have.

7 Q Okay. How would you have identified those
8 activities as being performed by someone at Tyson
9 Foods, for example?

10 A Well, how they are identified or how I 01:44PM
11 personally would have identified it?

12 Q Well, how you personally would have identified
13 it?

14 A Well, I would identify -- I have observed
15 spreading within the watershed of waste, and I've 01:44PM
16 observed spreading in areas where there's a high
17 density of Tyson operators. So in that sense, I
18 would believe that I have observed Tyson spreading.

19 Q Okay. So if there's a Tyson farm in the
20 vicinity, someone who contracts with Tyson Foods and 01:45PM
21 a litter is being applied, you made the assumption
22 that Tyson Foods was actually spreading that litter;
23 is that fair?

24 A They could be among the many who were
25 spreading that litter. 01:45PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q But what I'm trying to get at, in Paragraph 5,
2 you said you had direct observation of poultry waste
3 being land applied by others, Tyson Foods, and I'm
4 wanting you to identify for me when you observed
5 that. 01:45PM

6 A I've observed spreading.

7 Q Okay, and let's be clear if we can. Have you
8 observed any of the companies as opposed to contract
9 growers spreading poultry litter?

10 A Well, the spreaders I have observed -- I do 01:45PM
11 believe I've seen a George's liquid spreader
12 applying.

13 Q Okay.

14 A Because it was a company truck that had
15 George's on the side. 01:46PM

16 Q Okay.

17 A The other spreaders that I have observed had
18 no signs on them.

19 Q Okay. You've not observed a truck that bears
20 the logo of Tyson Foods spreading poultry litter in 01:46PM
21 the watershed, have you?

22 A I have not personally, no.

23 Q Okay. Has any investigator reported to you
24 that he or she observed a truck bearing the logo of
25 Tyson Foods spreading poultry litter in the 01:46PM

TULSA FREELANCE REPORTERS
918-587-2878

1 watershed?

2 A That's not what they've observed.

3 Q Okay.

4 A They would have made their observations in a
5 different way. They would have observed to tie a 01:46PM
6 specific integrator to a specific spread site. They
7 would have identified the origin of the waste, and
8 then tracked that spreading operation to its point
9 of deposition.

10 Q Okay. Would it be more accurate, and if it 01:46PM
11 would not, you tell me, Dr. Fisher, for Paragraph 5
12 to provide that you've received reports and you've
13 had observation of poultry litter that originated
14 from farms under contract with each of the companies
15 being applied in the watershed; is that what you 01:47PM
16 were trying to say?

17 A What I'm trying to say is there's a sign out
18 front that says Tyson or Petersons or --

19 Q What does it say beneath that sign?

20 A Sometimes it says nothing beneath that sign. 01:47PM

21 Q Is there a sign out front that shows who is
22 actually performing the application?

23 A No.

24 Q Okay. So again back to Paragraph 5, what's
25 the basis for your statement that you have seen a 01:47PM

TULSA FREELANCE REPORTERS
918-587-2878

1 significant amount of poultry waste being applied in
2 the watershed by Tyson Foods?

3 A It's coming from a farm under contract here.

4 Q Well, you didn't say that in Paragraph 5, did
5 you? 01:47PM

6 A No, I didn't.

7 Q Okay. Do you have any evidence of poultry
8 litter being applied by Tyson Foods in the
9 watershed?

10 A It's coming from Tyson facilities. 01:47PM

11 Q Can you answer my question, sir?

12 A I think I already have.

13 Q Okay.

14 MR. GEORGE: Can you read it back, please?

15 (Whereupon, the court reporter read 01:48PM
16 back the previous question at Page 142, Lines 7-9.)

17 MR. PAGE: Are you going to ask that again;
18 are you asking that question again?

19 MR. GEORGE: Yes.

20 MR. PAGE: I'll object to the form. 01:48PM

21 Q Can you answer that question?

22 A I think I have. I've seen waste from Tyson
23 facilities being applied in the watershed.

24 Q That's a different statement, is it not, than
25 what you said in Paragraph 5? 01:48PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: Object to the form.

2 A I really don't think it is.

3 Q Dr. Fisher, what assumptions underlie your
4 conclusion that you believe that you've seen waste
5 from Tyson Foods being applied in the watershed? 01:48PM

6 A That the facility from which that material
7 originated bore a Tyson's logo.

8 Q Okay. Did you follow a spreader truck to a
9 farm under contract with Tyson?

10 A Yes. 01:49PM

11 Q You did personally?

12 A Personally, no.

13 Q Okay, all right. Other than your belief that
14 you can source application in the watershed to farms
15 under contract with Tyson Foods, do you have any 01:49PM
16 other evidence of Tyson Foods applying poultry
17 litter in the watershed?

18 A Yes.

19 Q What is that?

20 A From the Oklahoma Department of Agriculture, 01:49PM
21 Food & Forestry records, which in their poultry
22 registration specifically list the integrator with
23 which a grower is associated, there are specific
24 records that relate source farms to spread sites
25 within the watershed. 01:49PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Those records are compiled and produced by
2 litter applicators who are certified by the
3 Department of Ag; correct?

4 A No. They're actually compiled from two
5 sources. There are litter applicator reports that 01:50PM
6 are in fact compiled by commercial applicators.
7 There are also application reports compiled by
8 individual growers.

9 Q Okay. Is Tyson Foods a registered commercial
10 applicator of poultry litter for the Illinois River 01:50PM
11 watershed?

12 A Not to my knowledge.

13 Q Okay. You didn't see any report where Tyson
14 Foods filled out a report and said we applied X tons
15 of litter on this date in the watershed; right? 01:50PM

16 A No. I've seen waste from Tyson facilities --
17 records of waste from the Tyson facility applied in
18 the watershed.

19 Q Now, with respect to these reports from
20 investigators, how many investigators are we talking 01:50PM
21 about?

22 A All told, gosh, I'd have to go through my
23 records because there were a number of people
24 involved, but there are probably four or six
25 consistent ones. 01:51PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. Can you give me their names, please?

2 A Certainly. Steve Still -- Steele, Rod Hummel,
3 Gary Stansill, Liz, Elizabeth Weatherly, Shane
4 Teull, T-E-U-L-L, I think, gosh, Mike Huff and I
5 think Robert -- I can't think of his last name. 01:51PM

6 Q What are the qualifications --

7 A And I'm sorry. Danny Langford.

8 Q What are the qualifications of those eight
9 individuals to be investigating agricultural
10 practices? 01:52PM

11 A They are Tulsa Police officers working off
12 duty.

13 Q All eight of them are?

14 A Yes.

15 Q Okay. Do they have any background in
16 agriculture? 01:52PM

17 A I think we may have one or two guys. I can't
18 recall specifically, but they certainly -- here's
19 what they can do, if you want to know what they can
20 do. They can identify a poultry facility, and they 01:52PM
21 can report on activities seen at that facility, as
22 well as attributes of the facility that are defined
23 to them.

24 Q These reports that they provided to you, were
25 they provided orally or in writing? 01:53PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A In writing.

2 Q Okay, and did you produce those as part of
3 your materials?

4 A I produced reports relevant to waste disposal
5 as part of my materials, and they were previously 01:53PM
6 produced to you in the documents that are referred
7 to specifically by Bates number.

8 Q Okay. I'll tell you what I saw in your
9 physical production and I've looked at what you
10 referred me to in the Bates numbers. What I saw in 01:53PM
11 your physical production was photos and videos, not
12 written reports.

13 A I know there are written reports in there.

14 Q Okay. In your physical production?

15 A Yes. 01:53PM

16 Q Okay. To the extent you received reports from
17 investigators regarding waste disposal practices or
18 land application of poultry litter, whatever
19 terminology you want to use, have you produced
20 those? 01:53PM

21 A To my knowledge, yes.

22 Q Okay. Did any of these reports or your
23 conversations with the investigators provide you
24 with information that any person involved in the
25 land application of poultry litter in the watershed 01:54PM

TULSA FREELANCE REPORTERS
918-587-2878

1 was breaking the law?

2 MR. PAGE: Object to the form.

3 A There is no observation as to that.

4 Q Okay. So the eight investigators who spent a
5 considerable amount of time in the watershed
6 observing litter application practices never came
7 back to you and said we caught somebody violating
8 the law?

01:54PM

9 MR. PAGE: Object to the form.

10 Q Is that true?

01:54PM

11 A I received reports and there are reports of
12 spreading which appears too near streams. You know,
13 that's -- that appears to be a violation.

14 Q Okay. You're basing that on your review of a
15 video?

01:54PM

16 A Review of a video and their verbal report and
17 I believe the written report as well.

18 Q Let me ask the question again. Did any of the
19 eight reporters who spent significant time in the
20 watershed come back to you and say, Dr. Fisher, we
21 caught somebody breaking the law?

01:54PM

22 MR. PAGE: Same objection.

23 A No.

24 Q Were they -- were the investigators given a
25 tutorial on distances from streams and requirements

01:55PM

TULSA FREELANCE REPORTERS
918-587-2878

1 for land application of poultry litter?

2 A Yes.

3 Q They were? Who provided that?

4 A It was provided from materials from the

5 Department of Agriculture.

01:55PM

6 Q If there had been an observed violation of the

7 law, would you have reported it to the Oklahoma

8 Department of Ag or to the Arkansas Natural

9 Resources Commission?

10 A Yes, I would have. Oh, and let me think here.

01:55PM

11 In fact, there was -- there appeared to be a

12 violation that was reported and had to do with

13 improper composting of dead chickens. That was

14 reported to Dan Parrish. Poultry inspector was sent

15 on that -- out to inspect. I don't know the results

01:56PM

16 of that.

17 Q That was my question. Do you know what

18 happened as a result of that report?

19 A I do not.

20 Q Okay. Other than that one instance relating

01:56PM

21 to composting of dead chickens, did you make any

22 other reports to agencies in either Arkansas or

23 Oklahoma of real or perceived violations of the law

24 with respect to the handling or application of

25 poultry litter?

01:56PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A No.

2 Q How much time did you spend in the watershed,
3 sir, yourself on these direct observations?

4 A In terms of -- gosh. I'd have to look at my
5 records, but I suspect I spent maybe 60 days all 01:56PM
6 told days in the watershed from time to time. That
7 wasn't my role specifically to look for application,
8 but I certainly observed application.

9 Q Did you also observe cattle in the watershed?

10 A I did. 01:57PM

11 Q Okay. Did you ever observe cattle in streams?

12 A I observed a fraction of the cattle in
13 streams, yes.

14 Q Okay. So there would be an occasion you'd
15 drive over a bridge and you would look in the stream 01:57PM
16 and you'd see a cow?

17 A Sure.

18 Q Did you ever observe a cow defecating in the
19 stream?

20 A No. 01:57PM

21 Q Would it surprise you that cows do frequently
22 defecate in the streams?

23 MR. PAGE: Objection to form.

24 A No, it would not surprise me.

25 Q Let me refer to your affidavit, Page 8, 01:57PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Paragraph 9. In Paragraph 9 you state that bacteria
2 from poultry waste are transported by water from the
3 surfaces of the fields where poultry waste is
4 applied to both surface and groundwater; do you see
5 that statement? 01:58PM

6 A I do.

7 Q Okay. Can you quantify for me the amount of
8 poultry waste, particularly bacteria, that was
9 transported to surface water in the Illinois River
10 in 2007? 01:58PM

11 A I cannot.

12 Q Can you quantify for me the contribution of
13 bacteria from poultry waste to any water body in the
14 Illinois River watershed?

15 A I believe there are other experts in this case 01:59PM
16 who will do that. I cannot.

17 Q Okay. Next sentence you state that eventually
18 these poultry waste constituents are transported by
19 the flow of water within the Illinois River
20 watershed to Lake Tenkiller. Do you see that 01:59PM
21 statement?

22 A Yes.

23 Q How much poultry waste constituents, namely
24 bacteria, made its way all the way to Tenkiller in
25 2007? 01:59PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I believe other experts will testify on that.

2 Q You don't have an opinion on that subject?

3 A I do not have an opinion, except that they
4 would make it there.

5 Q But you don't know whether it's -- 01:59PM

6 A How many, no.

7 Q -- one particle or a bunch of particles?

8 A That's correct.

9 Q Going down to the next paragraph, Paragraph
10 10, you make a reference to acoustic measurements? 01:59PM

11 A Yes.

12 Q What are you referring to?

13 A Acoustic measurements are measurements using a
14 low frequency transponder that has the ability to
15 penetrate the unconsolidated sediments that have 02:00PM
16 accrued within Lake Tenkiller. That's what it is.
17 It's a sonar unit, subbottom sonar.

18 Q Okay, and it allows you to determine the rate
19 of sedimentation; is that fair?

20 A Well, indirectly. It allows you to determine 02:00PM
21 the thickness of the sediments.

22 Q What are you relying upon acoustic
23 measurements for in connection with the affidavit
24 that you've submitted in this case?

25 A The acoustic measurements were used to 02:00PM

TULSA FREELANCE REPORTERS
918-587-2878

1 identify areas in the lake that appeared to have
2 sediment thicks of undisturbed material.

3 Q Did you use the acoustic measurements to
4 identify the places where you obtained sediment core
5 samples?

02:00PM

6 A Yes.

7 Q Okay. I believe, and we'll get into this in
8 some more detail in a moment, that you took sediment
9 core samples from four locations in the lake; is
10 that correct?

02:01PM

11 A Actually they're collected from six locations.
12 Two of the locations were inappropriate for
13 geochronology either because they were too short, it
14 was too short a section or because it appeared to be
15 disturbed, and there was no further analysis done on
16 those.

02:01PM

17 Q I would assume that they didn't appear to be
18 disturbed based on your acoustic measurements or you
19 would not have taken a sample there; is that right?

20 A Well, in the one case we did not have an
21 acoustic measurement of that site. It was upriver
22 and identified to us as a very thick accumulation of
23 sediments. We examined that, and I determined it
24 was probably disturbed.

02:01PM

25 Q Who identified it as a thick accumulation of

02:01PM

TULSA FREELANCE REPORTERS
918-587-2878

1 sediments?

2 A Tim Knight, who was the diver, who is very
3 familiar with -- our diver, and he was very familiar
4 with Lake Tenkiller.

5 Q This one sediment sample that you are 02:01PM
6 referring to that was excluded was actually taken in
7 the river as opposed to the lake?

8 A Yeah, and as a consequence, I believe it to be
9 disturbed and no further analysis was conducted.

10 Q Well, was paperwork generated in connection 02:02PM
11 with at least obtaining the core sample?

12 A In the field notebook.

13 Q Okay. Would the field notebook identify for
14 me the precise location from which that sediment
15 sample was collected? 02:02PM

16 A It would.

17 Q Okay. How, after you obtained that sediment
18 sample, did you determine that it had been
19 disturbed?

20 A It was present in an area that was -- would be 02:02PM
21 subjected to rapid, very rapid episodic
22 sedimentation, and we were really looking for a
23 continuous record of slow sedimentation.

24 Q How could you tell that from looking at the
25 sediment sample? 02:02PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A You could look at it because you could see
2 partings within the sediment that appeared to be
3 large packages of sediment that had been dumped.

4 Q Now, you said you collected six, and I've only
5 seen four. We've identified one other. What 02:03PM
6 happened to the fifth, if you will?

7 A The fifth was, as I recall, was also -- may
8 have been discarded. You would have the chemical
9 data, if there was any chemical data associated with
10 it, but the sixth sample was taken on the dam side 02:03PM
11 of the islands, and it was of insufficient thickness
12 to -- either it had some erosion or removal or it
13 was too thin to section for geochronology.

14 Q How thick does it have to be to section for
15 geochronology? 02:03PM

16 A Well, you need to have the ability to do a
17 series of two centimeter slices, and this, I recall,
18 was maybe five or six centimeters thick. There was
19 virtually no recovery.

20 Q In contrast with respect to the four core 02:03PM
21 samples that we're going to talk about in a moment,
22 how many centimeters were they?

23 A How many -- pardon?

24 Q How many centimeters?

25 A They were -- let me see if I recall correctly. 02:04PM

TULSA FREELANCE REPORTERS
918-587-2878

1 They're on the order of half a meter. It was on the
2 order of 50 centimeters, 40 centimeters, 30
3 centimeters. They were a reasonable thickness.

4 Q How did you use your sediment core sampling in
5 your analysis? 02:04PM

6 A Maybe you need to break that down.

7 Q Why did you collect sediment core samples?

8 A I was -- had suggested that it would be useful
9 to investigate the history of poultry waste impact
10 on Lake Tenkiller, which it reflects the history of 02:05PM
11 the watershed. Lake Tenkiller sediment, where they
12 have accrued over time, contain a complete history
13 of the watershed.

14 Q History in terms of what?

15 A History in terms of the chemistry of materials 02:05PM
16 that are exiting the watershed and accruing in
17 sediments. So it records changes in land use. For
18 example, it would record inputs of poultry waste
19 into the watershed that are subsequently put into
20 Lake Tenkiller. 02:05PM

21 Q How is it going to record inputs of poultry
22 waste?

23 A Records inputs of poultry waste chemically.
24 The poultry waste itself is chemically quite
25 distinctive from soils in the watershed. It 02:05PM

TULSA FREELANCE REPORTERS
918-587-2878

1 contains very high levels of phosphorus, high levels
2 of copper and zinc and arsenic in most cases, except
3 for Tyson's, I believe current waste is not, but
4 historically it would have. So there is a chemical
5 signature, which I believe Dr. Olsen will discuss,
6 that relates waste composition to its so-called
7 poultry signature, but it's chemically distinctive.

02:06PM

8 The only large significant source of -- it's not
9 just looking at phosphorus, for example. You're
10 looking at numerous components. In this case I
11 think Dr. Olsen looked at 26 components. In this
12 case we could refer your attention to the ones that
13 are very easily demonstrated to be changing in time,
14 and those would be phosphorus, copper, zinc and
15 arsenic.

02:06PM

02:06PM

16 Q All right. You do not disagree, do you, sir,
17 there are other sources, significant sources of
18 phosphorus in the watershed?

19 A I think there are other sources of phosphorus
20 in the watershed.

02:07PM

21 Q But you don't know whether they're significant
22 or not?

23 A I have not completed that analysis.

24 Q I thought you just told me that the only
25 significant sources of some of these chemicals were

02:07PM

TULSA FREELANCE REPORTERS
918-587-2878

1 poultry?

2 A Well, in combination, that's true.

3 Q Well, is there another significant source of
4 copper in the watershed?

5 A It's not as simple as individual sources. 02:07PM
6 There's a specific composition of the waste with
7 respect to its internal consistency of phosphorus,
8 copper, zinc and arsenic.

9 Q Well, explain that internal consistency
10 between the specific components that is the 02:07PM
11 signature of poultry waste.

12 A I think that's really Dr. Olsen's position.

13 Q Are you relying at all, sir, upon any
14 independent work that you've done yourself regarding
15 a chemical signature for poultry as part of your 02:08PM
16 opinions offered in the affidavit in this case?

17 A A review of waste composition.

18 Q Okay. Tell me --

19 A Which would confirm that poultry waste is --
20 shows elevated levels of phosphorus, copper, zinc 02:08PM
21 and arsenic.

22 Q Okay. When you say elevated, elevated in
23 reference to what?

24 A Well, elevated in reference to soils.

25 Q Soils are not the only source of phosphorus, 02:08PM

TULSA FREELANCE REPORTERS
918-587-2878

1 copper, zinc and arsenic in the watershed, are they?

2 A No, but they would be different from other
3 wastes.

4 Q Okay. Well, have you compared the levels of
5 phosphorus, copper, zinc and arsenic in poultry 02:08PM
6 litter to other wastes?

7 A I think Dr. Olsen has.

8 Q Okay. So again with respect to this
9 composition of poultry waste and whether that is
10 reflected in an environmental sample, you're 02:08PM
11 referring that to Dr. Olsen?

12 A In part, but I would concur with his analysis.

13 Q Well, then since you concur in it, and I'm
14 concerned that you might testify about it at the
15 hearing, why don't you tell me about that analysis. 02:09PM

16 A Okay. I'm going to defer to Dr. Olsen to
17 explain the analysis to you.

18 Q Okay. So you're going to defer to Dr. Olsen?

19 A Yes.

20 Q Okay. Do you intend to testify about the 02:09PM
21 elevated levels of phosphorus, copper, zinc and
22 arsenic in poultry litter compared to other wastes?

23 A If I'm asked that question, I would say that
24 poultry litter has -- appears to be at elevated
25 levels. 02:09PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q In comparison to what?

2 A In comparison to soils.

3 Q Can you comment on anything beyond soils
4 comparatively?

5 A Not at this time. 02:09PM

6 Q Other than the chemical signature work that's
7 been done by Dr. Olsen, Dr. Fisher, how have you
8 used the chemical analysis of sediment cores in
9 forming any opinion in this case?

10 A I have examined the changes in the abundance 02:10PM
11 of livestock and humans within the watershed over
12 time and compared that to the concentrations of
13 phosphorus in the lake cores.

14 Q So you've looked at, whether it be increasing
15 or decreasing, concentrations of a particular 02:10PM
16 constituent in a sediment sample?

17 A Correct. It's increasing.

18 Q Okay, and you've dated that particular slice
19 of the sediment sample and then compared that to
20 data available for animal populations that same 02:11PM
21 year; is that correct?

22 A Yes.

23 Q Okay. Would you agree with me that a critical
24 part of that analysis is the correctness in the date
25 that has been assigned to the various slices of the 02:11PM

TULSA FREELANCE REPORTERS
918-587-2878

1 core samples?

2 A Within reason, yes, within error.

3 Q Well, what is an acceptable range of error for
4 you with that dating analysis?

5 A Well, how the date is grained. With respect 02:11PM
6 to the animal data, it's grained on a five-year
7 level. So we would like to be on the order of five
8 years, within five years of the date.

9 Q Okay. So if the dates assigned to various
10 slices in the core sampling are off by seven to ten 02:11PM
11 years, that would throw your analysis completely off
12 track, would it not?

13 A No.

14 Q It would not?

15 A No. 02:12PM

16 Q Okay. Why not?

17 A Because you would still be able to look at
18 some other critical features. There are some dates
19 that can't be thrown off. For example, in one of
20 the cores, we penetrated what obviously was a 02:12PM
21 preexisting soil surface, and that would be time of
22 closure of the dam. It appears to take a little bit
23 of time for sedimentation rate to pick up, and then
24 it does pick up, and what we see is at the base of
25 that core, you see one phosphorus concentration. At 02:12PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the top of that core we see another phosphorus
2 concentration, with a relatively smooth progression
3 or apparently smooth progression of increase in
4 phosphorus concentration within the core.

5 Consequently, you would then, in the simplest 02:12PM
6 analysis, simply compare that to what's the ratio of
7 phosphorus concentration at the bottom of the core
8 to what it is at the top and compare that to what
9 poultry population looked like about the time the
10 dam closed to what it looked like at about the 02:13PM
11 time -- about the time the core was taken and
12 compare that to other relative changes in animal
13 populations.

14 In the case of the core that I'm thinking of,
15 which I believe is Lake Sed 1, what you find is that 02:13PM
16 the phosphorus concentration at the base is about
17 200 and at the surface is about 1,400, a factor of
18 seven. Broiler sales show a factor of seven
19 increase. Cattle show approximately a factor of two
20 increase. I think people show about a factor of 02:13PM
21 three, but the only correlation that makes sense
22 with respect to predicting the phosphorus are the
23 broiler numbers.

24 Q Have you set forth that analysis in the paper
25 that was produced to me? 02:14PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A It's in the numbers.

2 Q Okay. Have you set out an analysis that shows
3 I'm just going to look at the beginning phosphorus
4 concentration and the end concentration, and then
5 I'm going to make a conclusion about the source? 02:14PM

6 A I have not written a report about this.

7 Q Okay. In fact, the reports that have been
8 produced regarding the dating of core samples take
9 an incremental approach, assigning different dates
10 to each slice, and then looking at animal 02:14PM
11 populations over every two or three or four-year
12 periods; correct?

13 MR. PAGE: Object to the form.

14 A Yes. Well, wait a second. That's one --
15 that's the simplest means of approaching the 02:14PM
16 analysis is the mean -- is the analysis I just
17 described to you. The analytical moiety or modality
18 that you're describing is more detailed. That is,
19 we would be looking at that core and saying that
20 this slice is from this time range because we have a 02:14PM
21 length of sediments from the time range, not from a
22 given year, and then you would look at the animal
23 population with respect to changes in the
24 concentrations of materials that are present.

25 Okay. The other piece or line of evidence, 02:15PM

TULSA FREELANCE REPORTERS
918-587-2878

1 which is also present in numbers, if you cross block
2 them, is that as phosphorus increases in the lake
3 sediments, there is a direct proportionality with
4 the increase of zinc and copper and a less
5 convincing one with arsenic, but it's there. 02:15PM
6 There's an increase in all of those components as a
7 function of an increase in phosphorus numbers over
8 time.

9 So a number of ways of looking at that
10 information, today and yesterday, or all the 02:15PM
11 yesterdays, and there are degrees of how sure you
12 are yesterday, is where it is, as we discussed
13 earlier.

14 Q Let's look at the work that's been done.
15 Exhibit No. 8 is an example of sediment core dating 02:15PM
16 analysis.

17 A Sure.

18 Q Who actually prepared the report that is set
19 forth as Exhibit No. 8?

20 A This is prepared by Dr. Frederick Soster at 02:16PM
21 DePauw University.

22 Q How do you say -- how do you pronounce --
23 sorry, how do you spell his last name?

24 A S-O-S-T-E-R.

25 Q And he is with DePauw University? 02:16PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A D-E-P-A-U-W in Greencastle, Indiana.

2 Q And how did Frederick Soster come to be
3 involved in the sediment core dating analysis in
4 this case?

5 A Frederick Soster was an individual who was a 02:16PM
6 graduate at Case Western Reserve University when I
7 had -- was head of post-off, and I had learned that
8 subsequent to knowing him there, he had become
9 heavily involved in doing lead-210 dating of lake to
10 marine cores, and his instrument was available for 02:17PM
11 use.

12 Q So you retained Dr. Soster to provide the
13 sediment core dating analysis for your use in this
14 case?

15 A That's correct. 02:17PM

16 Q Okay. Is this an area in which you have
17 particular expertise?

18 A Yes.

19 Q Okay. Could you have completed this sediment
20 core dating analysis yourself? 02:17PM

21 A Not easily because I did not have an
22 appropriate machine. Could have been done but it
23 would have been difficult to do.

24 Q Okay. Who actually analyzed the data to
25 arrive at the dates that are assigned in Exhibit No. 02:17PM

TULSA FREELANCE REPORTERS
918-587-2878

1 8? Let's say, for example, Core No. 1, which
2 appears graphically on Page 1767; do you see that?

3 A Yes.

4 Q There is a date of -- let's just say 1973
5 assigned to the slice at what depth of centimeter? 02:17PM

6 A That's lead-210 date.

7 Q Right.

8 A And that date is assigned at a depth of -- 33
9 centimeters would be the midpoint.

10 Q So what I understand correctly, based on the 02:18PM
11 analysis done by Dr. DePauw (sic), he's come to the
12 conclusion, which you support, that the core slice
13 of sediment at the 33 centimeter depth of this
14 particular sediment sample was laid down in 1973?

15 A No. He's come to the conclusion that based on 02:18PM
16 the constant flux model for unsupported lead-210,
17 that the sediment has what we generally call as
18 apparent dates of 1973. So the model age for that
19 is 1973.

20 Q Well -- 02:18PM

21 MR. TUCKER: Would you say that again?

22 A There's something else to notice here.

23 Q Go ahead.

24 MR. PAGE: Could we just have one person
25 ask a question at a time? 02:18PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. TUCKER: I couldn't hear him.

2 MR. PAGE: Oh, you couldn't hear him?

3 MR. TUCKER: No. I asked him if he would
4 mind saying it again.

5 Q Would you say it again, sir? 02:19PM

6 MR. PAGE: Thank you.

7 MR. TUCKER: I'm sorry, I wasn't asking a
8 question.

9 MR. PAGE: Why don't you just read back the
10 question? 02:19PM

11 (Whereupon, the court reporter read
12 back the previous answer.)

13 A It's a model age.

14 Q What does that mean?

15 A Well, what it means is that based upon the 02:19PM
16 modeling that's been done on this, that when we look
17 back, we have, for example, around 2000 is around 8
18 centimeters. Those models' ages all look pretty
19 solid. When we get back into this 1970's range,
20 they look compressed. There's not an -- we don't 02:20PM

21 have an average. The average sedimentation is
22 really -- if you looked at all the averages, it
23 would be about 1.8 centimeters per year, but no
24 sedimentation rate is ever averaged, and that's why
25 lead-210 is used to date the cores, because you can 02:20PM

TULSA FREELANCE REPORTERS
918-587-2878

1 get a much better date on them from that than you
2 can from cesium-137, which is an alternative method
3 of trying to achieve a date.

4 So if you were looking for what are called
5 concordant ages, you would look -- if -- and this is
6 a perfect cesium-137 record, you are really looking
7 at two different nuclei here. Lead-210 is derived
8 from uranium-238 decay, which is a fairly -- uranium
9 is fairly common, and you're looking at the
10 unsupported lead-210. That is, you're looking for
11 the lead-210 that is being generated. It's been
12 swept into the watershed having been generated in
13 the atmosphere from radon 222 decay.

14 So that's a constant flux. The crust is
15 constantly outgassing this material. It's decaying
16 at a known rate, falling down on the land surface
17 and being swept in by rainfall. So you're looking
18 at the unsupport -- because there's supported
19 lead-210 presence as well. By your nods, I see you
20 must be an expert. So that's a natural radial
21 nuclei. This curve here is a cesium-137 record.
22 Cesium-137 is anthropogenic nuclei. Cesium-137 was
23 generated by -- well, it's generated by Chernobyl
24 for one thing recently, but the big inventory of
25 cesium-137 in the atmosphere was generated by

02:20PM

02:20PM

02:21PM

02:21PM

02:21PM

TULSA FREELANCE REPORTERS
918-587-2878

1 nuclear testing in the 1960's.

2 So when you are looking here if you are
3 looking for concordance, they aren't concordant.
4 Dr. Soster informed me that it's frequently true in
5 lakes and reservoirs that we see this, that we see
6 the lead-210 age being younger than the cesium-137
7 age at the base.

02:22PM

8 Based on my knowledge and his knowledge, I
9 would be very happy with saying this is when
10 sedimentation began because we had material that's
11 clearly an old soil surface present there when the
12 dam was closed. It appears in here that we have
13 probably compressed ages, that the sediment yield to
14 that system was fairly low in its early days, and so
15 between 1954, '55 when this closes and begins
16 accruing water and in the first 20 years or so of
17 its history, it's not accruing too much sediment.
18 Then that seems to pick up. So these ages up here
19 you're a little bit happier with than the ages below
20 that.

02:22PM

02:22PM

02:23PM

21 So after that dissertation, which I'm sure was
22 an overly long answer to a simple question, we can
23 ask the next question.

24 Q Let me ask the next question. As between the
25 dates that were assigned with a lead-210 analysis

02:23PM

TULSA FREELANCE REPORTERS
918-587-2878

1 and those assigned with a seize -- how do you say
2 it, cesium?

3 A Cesium.

4 Q Cesium-137, which method did you select?

5 A I selected the lead-210 method because the 02:23PM
6 cesium-137 method only permits three estimations of
7 time. It would -- in this case only three, and if
8 you didn't have the old soil surface, only two. You
9 would know today and you would know roughly 1962,
10 '64. 02:23PM

11 Q So your coordinating and the basis for the
12 comparison of those dates to changes in animal
13 production in the watershed is based on a lead-210
14 analysis?

15 A That's correct. 02:23PM

16 Q Okay. Which cores are used in your analysis
17 of the dates for purposes of comparing growth in
18 animal populations in the watershed?

19 A The best looking core with respect to date,
20 that is, the least disturbed section is Core 1, but 02:24PM
21 all the cores are used.

22 MR. TUCKER: Are the cores all used?

23 Q They all are used?

24 A They can all be used.

25 Q Well, have you used them all in your analysis? 02:24PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Yes.

2 MR. TUCKER: Was the last word, he muddled
3 his answers, used?

4 MR. GEORGE: Used.

5 MR. PAGE: I'm sorry, Mr. Tucker. Maybe we 02:24PM
6 need to put this on a loud speaker.

7 MR. TUCKER: Well, I have a street behind
8 me is part of the problem.

9 MR. BULLOCK: And Robert is getting closer
10 and their discussion, it's becoming more intimate. 02:24PM

11 MR. TUCKER: Got it. I apologize for
12 asking from time to time, but it's hard to hear you
13 sometimes.

14 Q Let me back up.

15 A Sure. 02:24PM

16 Q Have you done a separate analysis with the
17 date that is assigned from the lead-210 process for
18 each core or have you averaged the cores together?

19 A No. I've looked at each core.

20 Q Okay, but I mean have you laid it out 02:25PM
21 graphically for each core or do you only use one?

22 A I've laid it out graphically for each core.

23 Q Are there changes in the dates and, therefore,
24 the extent of correlation with animal population
25 depending upon which core you use? 02:25PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I don't believe there are.

2 Q You don't think there are any changes or
3 variations?

4 A Well, there's probably some change in
5 variation, but the overall story is the same, and 02:25PM
6 the internal chemistry is consistent.

7 MR. GEORGE: Let's change the tape real
8 quick.

9 VIDEOGRAPHER: We're now off the Record.
10 The time is 2:25 p.m. 02:25PM

11 (Following a short recess at 2:25 p.m.,
12 proceedings continued on the Record at 2:33 p.m.)

13 VIDEOGRAPHER: We are back on the Record.
14 The time is 2:33 p.m.

15 Q Dr. Fisher, if you look at Exhibit No. 8, it 02:33PM
16 shows the lead-210 dating analysis for all four
17 cores; is that correct?

18 A Yes.

19 Q Do I read those correctly to say that each
20 core the lead-210 analysis arrived at a different 02:33PM
21 date for each -- for the same centimeter of sediment
22 slice?

23 A Right, and that's not at all surprising, given
24 that there are variations of sedimentation
25 throughout the lake. So, for example, if you 02:33PM

TULSA FREELANCE REPORTERS
918-587-2878

1 look -- just consider the history of the lake to
2 extend from 1954 to the present. If you look at
3 Lake Core No. 1, our base unit, the core bottom is
4 at 41 centimeters. In Lake Core 2 it bottoms at 49
5 or 50 centimeters. In Lake Core No. 3 it's 02:34PM
6 bottoming at around 36 centimeters, and in Lake Core
7 No. 4 -- Lake Core No. 4 it's around 48 centimeters
8 and, secondly, there are variable rates of
9 sedimentation throughout the lake. That's the
10 reason that it's dated. Otherwise, all you would 02:34PM
11 have to do is use a tape measure.

12 Q But the analysis with respect to each core
13 assumes an average constant rate of sedimentation of
14 that location; is that correct?

15 A It does not. 02:35PM

16 Q Look at Core No. 1.

17 A Sure.

18 Q It says the average sedimentation rate equals
19 1.8 centimeters per year?

20 A That's correct. Now, the core -- I'm sorry. 02:35PM
21 I'm on Core 3. On Core 1 it would be an average of
22 1.8 centimeters per year, but that's not used in the
23 time analysis. The time analysis is based upon the
24 K constant for lead-210. Lead-210 is a half life of
25 22 and a half years. So roughly when you reach -- 02:35PM

TULSA FREELANCE REPORTERS
918-587-2878

1 every time you decrease activity by a half, you've
2 gone back 22 and a half years in time. So that's
3 what that's based on. It's not based upon length.
4 The average sedimentation rate is simply saying
5 based on all my lead-210 dates, if sedimentation 02:35PM
6 were constant over the time that I have those dates,
7 that would be the average rate of accrual.

8 Q Okay. Does the model or the analysis used in
9 the lead-210 dating assign a sedimentation rate each
10 year, a different sedimentation rate? 02:36PM

11 A Yes.

12 Q How does it do that?

13 A It would do that as a mass loading. When this
14 measurement is made, you're measuring the inventory
15 of lead-210 in a slice. You are measuring inventory 02:36PM
16 of lead-210 in a subsequent slice. You're looking
17 at the change in lead-210 activity between those two
18 slices, but you're looking at it on a mass basis.
19 So you are looking at per gram dry weight of
20 sediment. 02:36PM

21 Sedimentation, there are a number of ways of
22 measuring. The way you're thinking of measuring it
23 is in centimeters per year. We all think about it
24 in that way or most of us would. I would think
25 about it in terms of grams per square centimeter per 02:36PM

TULSA FREELANCE REPORTERS
918-587-2878

1 year dry weight sediment because the sediments
2 themselves have variable water content with depth,
3 which is accounted for in this analysis. So near
4 the surface, there are less dry grams of sediment
5 per unit length than there are as you travel down
6 the core. It compacts.

02:37PM

7 Q So where would I go in the materials to
8 determine what the model assigned as the
9 sedimentation rate for 1970 and then what it
10 assigned for '71 and '73; how would I determine
11 that?

02:37PM

12 A I'd have to go look through Dr. Soster's
13 output because that would be of not a whole lot of
14 value. You could -- we're really interested in the
15 age of the midpoint of that slice of sediment, not
16 in the instantaneous rate of sedimentation. That
17 may be present or it may have been backed out in the
18 full lab reports for these.

02:37PM

19 Q Well, where are the full lab reports?

20 A They were produced to you.

02:37PM

21 Q Those have been provided in the materials?

22 A Yes, they were.

23 Q Do you recall, do they set forth the annual
24 sedimentation rate for each year between the slices?

25 A I do not recall whether they do or not, but

02:38PM

TULSA FREELANCE REPORTERS
918-587-2878

1 it's really immaterial to this analysis.

2 Q Well, it may be immaterial to you, but it
3 might be material to me. Can you go back to 1767,
4 which is the graph for Core No. 1?

5 A 1763 (sic)? 02:38PM

6 Q Yes, sir. The lead-210 --

7 A That's not the graph. That's a title --
8 that's a table.

9 Q Right here is what I'm looking at.

10 A 1767. 02:38PM

11 Q Isn't that what I said?

12 A No.

13 Q Okay. Sorry. The lead-210 plot has some
14 cross hatches on each year, I believe, that show a
15 range of something; do you see that? 02:38PM

16 A Yeah. It's a range in lead-210 activities.

17 Q Okay. So that is -- would that be similar to
18 a confidence interval?

19 A Yes, it is a confidence interval.

20 Q All right. So, for example, in 1983, based on 02:38PM
21 some uncertainty in the process, the model has
22 determined that there was anywhere from .1 to .15
23 unsupported lead-210; am I reading that correctly?

24 MR. PAGE: I object to the form.

25 A I don't know if you are. It's very difficult 02:39PM

TULSA FREELANCE REPORTERS
918-587-2878

1 to read from a graphical representation. Let me see
2 if I look at the graph and agree with you. What
3 year are you referring to?

4 Q Just pick one. 1983 was the one I grabbed
5 ahold of.

02:39PM

6 A If I'm reading this from the graph -- okay.
7 If I'm reading this from the graph in 1983 and,
8 again, the uncertainties are given in the laboratory
9 reports provided to you, the activity difference,
10 which is what it's measuring there, is going to be
11 the difference between .115 becquerels per gram and
12 .140 becquerels per gram.

02:40PM

13 Q So the real number in terms of unsupported
14 lead-210 is somewhere in that range; is that what
15 that tells me?

02:40PM

16 A That would be where you would estimate it to
17 be, and you're given an average, the average value
18 from the count -- that's from counting statistics,
19 and the average value was this little square.

20 Q So in terms of a percentage variation or
21 uncertainty, what are we talking about here?

02:40PM

22 A You have to get at the years. We're talking
23 about not a whole heck of a lot. Let's give you an
24 estimate here, and this is a poor estimate, by the
25 way. You're looking at between plus four years and

02:41PM

TULSA FREELANCE REPORTERS
918-587-2878

1 minus four years.

2 Q So the range of uncertainty associated with
3 the lead-210 analysis is plus or minus fours years?

4 A Right, which is less than the uncertainty or
5 less than the grain of the animal population data. 02:42PM

6 Q Is that range of uncertainty less than the
7 dating that would have been accomplished using the
8 -- is it cesium?

9 A Cesium.

10 Q Cesium-137? 02:42PM

11 A Yes.

12 Q How so?

13 A Well, actually to put it this way, you really
14 wouldn't have much of a confidence estimate on the
15 cesium-137 since -- unless there was a bottoming 02:42PM
16 point where you had refusal. You would only have
17 two points to estimate from, and so you would

18 estimate it, but you would not know the error of
19 estimate. The lead-210 data provides you to do
20 that, and the testimony I have -- the quantitative 02:43PM
21 testimony I've given you here is based upon a very
22 rough interpretation of a graph and not upon a
23 review of the numerical information, which is what
24 it is.

25 Q Dr. Fisher, the cesium-137 plotting also has 02:43PM

TULSA FREELANCE REPORTERS
918-587-2878

1 confidence intervals plotted; correct?

2 A Those are confidence intervals of activity.

3 Q Okay. What's the distinction? I'm not
4 following you.

5 A The distinction is with respect to lead-210, 02:43PM

6 activity differences can be interpreted as times

7 because we start with a material that has a half

8 life of 22 and a half years, but there's continuous

9 input. So near the surface of the core, at the

10 surface you'll have the higher values, and it will 02:43PM

11 decay away. The unsupported lead-210 will

12 ultimately decay to zero after about a hundred

13 years.

14 Q I thought we were talking about the

15 cesium-137. 02:44PM

16 A Right, but I have to draw the distinction

17 because there's -- so what these errors bars are on

18 here, are counting errors with respect to the

19 activity determination of lead-210, but in the case

20 of lead-210 they have a temporal significance. 02:44PM

21 In the case of cesium-137, they do not.

22 Cesium-137's dating has to do with the notion of you

23 walk out onto -- if you have a farm pond at home and

24 you throw a bunch of red sand out there and you come

25 back 20 years later and you put a pipe down through 02:44PM

TULSA FREELANCE REPORTERS
918-587-2878

1 it, and you'll see some mud, a layer of red sand and
2 mud below. You'll know when you threw the sand out
3 there, early 2008. 2018, you'll have an accrual of
4 sediment, which you know has accrued since 2008, but
5 you don't have any idea of the details of accrual. 02:44PM
6 With lead-210, you do know the individual details of
7 accrual between slices.

8 Q Dr. Fisher, what is the generally recognized
9 peak in sediment samples in terms of a date for
10 cesium-137, cesium? 02:45PM

11 A It's going to be -- I think the recognized one
12 is 1964 worldwide.

13 Q Okay. So in a normal sense, when you are
14 looking at a sediment analysis and applying
15 cesium-137 for the dating protocol, you would expect 02:45PM
16 to see a peak in the data around 1963, '65,
17 somewhere in there?

18 A Well, you expect to see a peak in data in the
19 mid to late 1960's.

20 Q Okay, and -- 02:45PM

21 A Given -- I'm sorry, but given that, if you
22 look at this graph, there's a little bit of discord,
23 but it's not very strong.

24 Q Well, in fact, when you look at the peak in
25 the cesium-137 data, what date have you assigned 02:46PM

TULSA FREELANCE REPORTERS
918-587-2878

1 that peak under the lead-210 analysis?

2 A Well, there isn't -- first of all, there is
3 not a peak.

4 MR. PAGE: Object to the form of that last
5 question.

02:46PM

6 Q This is not a peak right here?

7 A No.

8 MR. PAGE: You said lead-210.

9 MR. GEORGE: Yeah. He has assigned dates
10 using lead-210 and I'm asking him to compare that to
11 the date that should have been assigned had he used
12 cesium-137.

02:46PM

13 A The cesium-137 peak may be as early here in
14 terms of lead-210 dates as 1970. There are problems
15 with -- as you look into smaller and smaller
16 watersheds with cesium-137, there can be some local
17 variation due to variations in rainfall and so on
18 and sweeping that material in. So with respect to
19 discordance, you know, there is discord. With
20 respect to severe discordance, there is not. What I
21 see here is a -- where you should see the

02:46PM

22 cesium-137. The cesium-137 tells you a couple of
23 things. First of all, we would anticipate it would
24 be near the bottom of the core, and it is, thank
25 God. If we're near the top, things would be way

02:46PM

02:47PM

TULSA FREELANCE REPORTERS
918-587-2878

1 off. If it were dating up here at 2000, that would
2 be a significant problem.

3 Q So if it was off 27 years, that would be a
4 significant problem?

5 A Yes. That would be a real big problem. 02:47PM

6 Q What's your tolerance or how far off can you
7 be on your dates?

8 A Bear with me on a dissertation.

9 Q Are you going to answer that question?

10 A Ultimately, because it's really kind of a 02:47PM

11 relative thing. If I'm looking at the cesium-137
12 curve here, what this tells me is there is little,
13 if any, mixing of the sediments, at least during the
14 time of the cesium input. It also says the cesium

15 input appears to have gone on over a number of 02:47PM

16 years. It's not a sharp peak. So that helped --

17 that corroborates the undisturbed nature of the

18 core, one, or at least its early days, and it also

19 tells me that discordance, to the extent it exists,

20 is present but it's not severe. So if I see 02:48PM

21 something like six or ten years in a reservoir core,

22 I would not be surprised.

23 Q Okay. So the dates, using either the lead-210

24 or the cesium-137 that you have assigned or that Dr.

25 Soster has assigned, could be off as much as ten 02:48PM

TULSA FREELANCE REPORTERS
918-587-2878

1 years?

2 A Well, I think if you look through -- no. I
3 think that what you're looking at here is I'm
4 assigning no dates from cesium-137. Even if I
5 assigned dates based on cesium-137, it would not
6 change the analysis.

02:48PM

7 Q Let me stop you there. Have you done that;
8 have you run the analysis using cesium-137 and
9 compared it to animal production in the watershed?

10 A Well, effectively so. Since you see where the
11 peak is, you can take a look at the lead-210 data
12 and look at it. So have I said, okay, here's the
13 cesium-137 age, no, because there's no point in
14 doing that since you don't know the details of
15 sedimentation in the recent past, which is the more
16 interesting part of the graph.

02:48PM

02:49PM

17 Q Okay. Let me clear up the Record. You have
18 not performed the comparative analysis using dates
19 that would be assigned to these sediment core slices
20 under the cesium-137 analysis; correct?

02:49PM

21 A That is correct.

22 Q Okay. Dr. Fisher, I'm going to hand you a
23 chart that I obtained from this CD that you were
24 looking at earlier, and I printed it off at the
25 office. It, again, does not bear a number that has

02:49PM

TULSA FREELANCE REPORTERS
918-587-2878

1 your identifier on it, but hopefully you'll accept
2 my representation that it came from your materials.
3 We'll mark it as Exhibit No. 9. It's a chart
4 entitled historical animal populations in the IRW.

5 Did you create Exhibit No. 9? 02:50PM

6 A Yes.

7 Q Okay, and what is the data, the source of the
8 data that you are plotting in Exhibit No. 9?

9 A Well, the course of the data that I'm plotting
10 here should be, and I believe is in the spreadsheet 02:50PM
11 you have, the data that's linked to animal inventory
12 information from the census of agriculture and human
13 population data. I believe the human population
14 data was generated by Alexander Consulting.

15 Q Okay. So you derived the human population 02:50PM
16 number from Alexander Consulting. Do you know where
17 they obtained it from?

18 A Yes. They looked at census-tracked data for
19 the watershed. I'm not aware of the details of how
20 it was done, but it seemed reasonable. 02:51PM

21 Q You're not aware of the details, but it seemed
22 reasonable?

23 A It seems reason -- well, it came from
24 census-tracked data and urban population center
25 information. 02:51PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Did they allocate people by percentage of
2 pasture in the watershed?

3 A No, they did not allocate people by percentage
4 in the pasture.

5 Q Why not? 02:51PM

6 A Why not? Well, I don't think that discussion
7 was ever had. We have a lot more specific
8 information as to where people are.

9 Q Okay. What information is that?

10 A Census-tracked information. 02:51PM

11 Q Okay, and would it identify people by
12 watershed?

13 A It identifies people by census track.

14 Q You're going to have to help me. What does
15 that mean? 02:51PM

16 A They would be allo -- I don't recall how the
17 allocation was made.

18 Q Okay.

19 A Let's just say that because I don't --

20 Q That's fair enough. You're taking Mr. 02:51PM
21 Alexander at his word and you have confidence that
22 he did it correctly?

23 A Yes.

24 Q Okay, but you don't know the details of how he
25 did it? 02:52PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I don't recall the details of how he did it.

2 Q Okay. What's the purpose of Exhibit No. 9;
3 what's this supposed to show me?

4 A Well, it's present in the title, just historic
5 animal populations within the Illinois River
6 watershed. 02:52PM

7 Q The units of measure on the left-hand column
8 are in 20 million increments; is that correct?

9 A Yes.

10 Q Who determined that that would be the 02:52PM
11 appropriate scale for this chart?

12 A I think Excel did.

13 Q Okay. Did you have human population or cattle
14 population reported in 20 million increments?

15 A No, but there are other graphs within this 02:52PM
16 production that blow that up so that you can see
17 them more clearly.

18 Q Okay. Do you agree with me that plotting the
19 number of animals in 20 million increments creates a
20 false impression of no significant increase in 02:52PM
21 either cattle or humans or swines in the watershed?

22 MR. PAGE: Object to the form.

23 A No.

24 Q Well, let's take it this way: Where's the
25 human line? 02:53PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Human line is right along the axis.

2 Q Okay, and it looks to me to be completely
3 flat. Does it look completely flat to you?

4 A At this scale, it is completely flat.

5 Q Okay. In fact, has there been an increase in 02:53PM
6 the human population in the watershed since 1945?

7 A Yes.

8 Q Okay. This chart doesn't show that, does it?

9 A Well, this chart shows that in comparison to
10 other animals, the human population number has not 02:53PM
11 changed substantially.

12 Q Well, how has it changed as a percentage
13 function in comparison to --

14 A It's about triple.

15 Q Okay. It's gone up three times? 02:53PM

16 A I think that's right. I think if you produced
17 all the charts, then I'd be able to review them and
18 tell you.

19 Q What about the cattle; which line is the
20 cattle? 02:54PM

21 A The cattle, for cow and calves is also right
22 along the axis.

23 Q Okay. It appears, at least visually, to be
24 flat; correct?

25 A Correct. 02:54PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. You'll agree with me there's been
2 considerable increase in cattle population in the
3 watershed from 1945 until the present?

4 MR. PAGE: Object to the form.

5 A Cattle population has roughly doubled in the 02:54PM
6 watershed in what looks kind of like a step function
7 from 1945 to the present. It's been pretty stable
8 for about the last 25 or 30 years.

9 Q This chart doesn't show that, does it?

10 A Other charts produced to you do show that. 02:54PM

11 Q I hand you what we'll mark as Exhibit 10,
12 which is another chart obtained from the materials
13 on the CD that you produced, Dr. Fisher, entitled
14 historical animal populations in the IRW. What's
15 the difference between this chart and the one we 02:55PM
16 just looked at?

17 A The scale has been changed.

18 Q When you change a scale, you can actually
19 detect the rise in the number of humans and the rise
20 in the number of swine and cattle; correct? 02:55PM

21 A That's correct, and you can no longer see the
22 chicken data.

23 MR. PAGE: I'll object to the form of that
24 last question.

25 Q Why is there no chicken data plotted on this? 02:55PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Because the chickens would be off this scale.

2 Q Okay. If I determined to use on the -- I
3 always get this wrong. What's the axis on the
4 left-hand side that goes up and down?

5 A Y. 02:56PM

6 Q Y axis. If I determined that it was
7 appropriate to analyze this data using 50,000 number
8 of animal increments instead of a hundred thousand,
9 what would it do to the lines?

10 A Well, it would make -- it would take these 02:56PM
11 lines off the chart. You would need a bigger piece
12 of paper.

13 Q Okay. Would you agree with me that if I
14 manipulated the numbers in terms of the scale in
15 this chart, that I could arrive at a line that 02:56PM
16 visually looks very similar to what you created for
17 on Exhibit No. 9?

18 MR. PAGE: Object to the form.

19 Q For broilers?

20 A On this chart? 02:56PM

21 Q Yes, sir.

22 A Only with respect to dairy cattle.

23 Q Okay.

24 A And actually it would look different. It
25 would still look different since the variation here 02:56PM

TULSA FREELANCE REPORTERS
918-587-2878

1 is -- for the main things is roughly a factor of
2 five over the span of the data, and they're all
3 basically within the same range, in the order of ten
4 to the fifth, and so it would be difficult to
5 generate a graph that had that amount of elevation
6 of the highest above the lowest as shown in Exhibit
7 9.

02:57PM

8 Q Other than increases in animal populations in
9 the watershed over a particular period of time, what
10 do these graphs, Exhibit 9 and 10, tell us?

02:57PM

11 A That's all.

12 Q That's it? In looking at the graphs in
13 Exhibit 9 and 10, can a scientist draw any
14 reasonable conclusion regarding contribution of
15 various animals to particular constituents found in
16 the Illinois River watershed?

02:57PM

17 MR. PAGE: Object to the form.

18 A Directly from these, A, there's a heck of a
19 lot of chickens. If you were estimating waste, you
20 would -- directly from these, you would use another
21 method. I mean this doesn't -- this shows you
22 relative change in waste with respect to
23 proportional change.

02:58PM

24 Q Okay. Do you agree with me that waste is the
25 more relevant analysis for purposes of this case,

02:58PM

TULSA FREELANCE REPORTERS
918-587-2878

1 that waste production as opposed to populations?

2 MR. PAGE: Object to the form.

3 A I think we need to look at both of those
4 things.

5 Q Okay. Have you looked at waste production for 02:58PM
6 cattle compared to poultry, compared to swine,
7 compared to humans over time in the watershed?

8 A I think that analysis is ongoing.

9 Q Well, are you completing that analysis?

10 A That analysis is being done by someone other 02:58PM
11 than myself.

12 Q Okay. Have you been asked to sponsor that
13 analysis as a witness at this hearing?

14 A No.

15 Q Okay. Who is completing that analysis? 02:59PM

16 A I think Alexander Consulting is completing
17 that analysis.

18 Q Have you seen any early work product from that
19 analysis?

20 A Yes. 02:59PM

21 Q Okay, and what does it show?

22 A Shows there is a heck of a lot of chicken
23 waste in the basin.

24 Q What does it show about cattle waste?

25 A Shows there's cattle waste in the basin. 02:59PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. Would I get a line in terms of waste
2 production for cattle that looks pretty similar to
3 chickens?

4 A No.

5 Q You don't think so?

02:59PM

6 A No. It would have a different functional
7 form.

8 Q What do you mean different functional form?

9 A Well, I mean, if you take a look at the
10 poultry, this is simply broiler sales if you are

02:59PM

11 looking at that. This has a form in which we
12 increase by roughly a factor of seven between the
13 most recent and, say, 1955. If you look at cattle
14 -- I guess I misspoke. Cow, roughly, actually

15 roughly has tripled. We go from a hundred thousand
16 to roughly 300,000 in cattle, so we would go up by a
17 factor of three. They're scaled differently because
18 there are different animal sizes, but there still
19 would be a heck of a lot of poultry left.

02:59PM

20 Q How many chickens does it take to excrete the
21 amount of waste that's excreted by a single beef
22 cow?

03:00PM

23 A That's -- that changes over time.

24 Q Why does it change over time?

25 A Because the size of chickens produced changes

03:00PM

TULSA FREELANCE REPORTERS
918-587-2878

1 over time.

2 Q Let's assume, you know, beginning of its life
3 cycle to the end, you know, a six-week broiler, how
4 many of those over their lifetime would it take to
5 create the amount of waste created by a single cow? 03:00PM

6 A I don't recall.

7 Q Okay. Did you know that at some point?

8 A Well, I did know that at some point, but you
9 really have to specify the mass of the six-week
10 broiler for that specific analysis. 03:00PM

11 Q You would need to know how much it weighed?

12 A For that analysis.

13 Q If I told you how much one weighed
14 hypothetically, could you give me a number?

15 A I'm tired. No. 03:00PM

16 Q Okay. Then I'm not going to go through it.
17 Let me hand you something, sir, that was produced
18 actually not as part of your materials but as part
19 of Dr. Olsen's that we'll mark as Exhibit No.
20 Exhibit 11. 03:01PM

21 MR. GEORGE: I apologize. It was kind of
22 lengthy and I've only got two copies, so I'm going
23 to keep one, David, and I apologize.

24 MR. PAGE: Sure. Give me a little time to
25 look over his shoulder, please. 03:01PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. GEORGE: Sure.

2 MR. PAGE: Thank you.

3 Q Exhibit No. 11, Dr. Fisher, appears to be a
4 PowerPoint presentation that was given, I assume, to
5 somebody at the Oklahoma Department of Agriculture 03:01PM
6 in 2006. Do you see that?

7 A I do.

8 Q In fact, it's dated January 4th of 2006;
9 correct?

10 A Yes. 03:01PM

11 Q Okay. Were you present for this presentation?

12 A I think I was.

13 Q Okay. Are these your materials or Dr. Olsen's
14 materials?

15 A I recognize a graph. Actually I can't tell 03:01PM
16 you. They might be -- one might be graphs that I
17 generated and gave to Dr. Olsen. I can't recall at
18 this time. He could have graphed the data himself,
19 but this would be reflective of --

20 Q Have you created graphs that resemble this 03:02PM
21 first slide, for example, phosphorus in Tenkiller
22 sediments versus broiler sales in the Illinois River
23 basin?

24 A Yes.

25 Q What other constituents have you created those 03:02PM

TULSA FREELANCE REPORTERS
918-587-2878

1 graphs for?

2 A Gosh, probably every listed constituent in
3 that data table, I looked at them at one time.
4 Whether or not I maintained all of those, I don't
5 know.

03:02PM

6 Q Have you created that for bacteria?

7 A No.

8 Q Why not?

9 A This is from the core analysis.

10 Q All right. Did you analyze cores for
11 bacteria?

03:02PM

12 A I don't recall that we did analyze those for
13 bacteria.

14 Q Okay. Given that you did not analyze the
15 cores for bacteria, what can that core sampling data
16 tell us about the relative contribution between
17 different sources to bacteria loads?

03:02PM

18 A It talks about waste loading in the basin.

19 Q Waste loading generally?

20 A Waste loading in the basin, that it would be,
21 my interpretation, is dominantly due to broilers.

03:03PM

22 Q Well, we need to be specific because the
23 preliminary injunction that you're supporting with
24 your affidavit that the State of Oklahoma is seeking
25 is only with regard to bacteria. Do you understand

03:03PM

TULSA FREELANCE REPORTERS
918-587-2878

1 that?

2 A Yes, I do.

3 Q Okay. What, if anything, can you tell me from
4 a scientific perspective based upon your work with
5 the core data regarding changes in contribution or
6 level of bacteria over time in comparison to poultry
7 production?

03:03PM

8 A This data would say that the amount of waste
9 generated by poultry has increased over time. Other
10 experts would form conclusions concerning what that
11 means with respect to bacteria.

03:03PM

12 Q Okay. So based on the core sampling data,
13 sir, you cannot offer any opinion as to the relative
14 increase or the source of bacteria in the Illinois
15 River or Lake Tenkiller; is that correct?

03:04PM

16 MR. PAGE: Object to the form.

17 A I'm not sure that's true.

18 Q Well, show me the data. Where's the data that
19 shows the correlation between bacteria
20 concentrations and the sediment core sample dating
21 that you completed and a rise in poultry production?

03:04PM

22 MR. PAGE: Object to the form.

23 A The sediment core sample data says that there
24 has been increased rate of disposal of poultry waste
25 within the watershed.

03:04PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Doesn't it really tell you, Dr. Fisher, that
2 there has been an increase in the amount of
3 phosphorus that is received at Lake Tenkiller; isn't
4 that what your concentration analysis of the core
5 samples tell you? 03:04PM

6 A The concentration analysis of the core samples
7 says there has been an increase, in time, of
8 phosphorus, copper, zinc and arsenic, and that in
9 combination, as Dr. Olsen will tell you, show that
10 they're from poultry. 03:05PM

11 Q Okay. Are you relying upon Dr. Olsen for that
12 in combination, those come from poultry analysis?

13 A Yes.

14 Q Okay. You'll agree with me that there's no
15 data associated with the analysis of the core 03:05PM
16 samples that allows you to draw a conclusion
17 regarding the impact increasing or decreasing of
18 bacteria on Lake Tenkiller?

19 MR. PAGE: Object to the form.

20 A I disagree with that. It talks about waste 03:05PM
21 loading.

22 Q The sediment core sample, when I pull it up on
23 a lab report, is going to talk about waste loading?

24 A No. This is interpreted to show waste
25 loading. 03:05PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q That's your interpretation?

2 A It is indeed.

3 Q But there's nothing in the data of the core
4 samples that is at all related to bacteria; correct?

5 MR. PAGE: Same objection. 03:05PM

6 A I think that's been answered.

7 Q Well, answer it again.

8 MR. PAGE: Same objection.

9 Q There's nothing at all in the chemical
10 analysis of the core data that you are relying upon 03:05PM
11 that relates to bacteria?

12 MR. PAGE: Objection.

13 A Okay. The core data shows an increase in
14 waste loading. Since the waste contains bacteria,
15 there has been an increase in loading bacteria to 03:06PM
16 the watershed.

17 Q Your assumption is that as the increase in
18 phosphorus has occurred, that there has been a
19 comparable increase in bacteria; is that fair?

20 A I would say that's fair. 03:06PM

21 Q Okay. Point me to the peer reviewed
22 literature that you would base that assumption on.

23 A More waste, more bacteria.

24 Q Okay. Can you point me to some literature?

25 A Not as I sit here right now. 03:06PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Sir, are you aware of anyone else in your
2 professional area who has used sediment samples that
3 do not report bacteria levels to draw a conclusion
4 as to the source of bacteria?

5 A Sediment core analysis is reflective of all 03:07PM
6 the processes in the watershed. There are numerous
7 scientific papers that draw inferences from chemical
8 changes in cores to other attributes of a watershed.

9 Q Identify for me, sir, either by name of the
10 researcher or author or title of the paper a single 03:07PM
11 piece of peer reviewed scientific work where a
12 researcher has inferred bacteria contribution from
13 sediment core analysis that does not report bacteria
14 concentrations.

15 MR. PAGE: Same objection. 03:07PM

16 A I don't know of any at this time.

17 Q Okay. Sir, when you look through Exhibit, I
18 lost track, 11, the only core analysis that -- the
19 only core I see being used in this analysis is Core
20 No. 1. I'll give you a moment to thumb through 03:08PM
21 there and see if maybe I just misunderstood the
22 slides.

23 A Okay, and you are referring to slides on Pages
24 1, 2 and 3, which would be Olsen's production 2853,
25 54 and 55? 03:08PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q That's correct, sir.

2 A That's correct, only Core 1 is depicted there.

3 Q Okay. Have you created the same sort of
4 charts using the other core samples?

5 A Yes. 03:08PM

6 MR. GEORGE: I want to call for the
7 production of those because I'm confident we don't
8 have them.

9 MR. PAGE: You asked earlier, and we'll get
10 them to you. 03:08PM

11 MR. GEORGE: Okay.

12 MR. PAGE: Although it looks like you have
13 some of them.

14 MR. GEORGE: Well, I don't have it for
15 another core is the issue. 03:08PM

16 MR. PAGE: We'll give you them.

17 Q What else, sir, in Exhibit No. 11 did you
18 create?

19 A Well, first of all, I'm not sure I actually
20 created these. 03:09PM

21 Q Okay. Well, let me rephrase it then. Can you
22 identify any of the materials in Exhibit No. 11 that
23 you have some reasonable degree of confidence that
24 you created?

25 A Okay. I don't even have a reasonable degree 03:09PM

TULSA FREELANCE REPORTERS
918-587-2878

1 of confidence that I created them. I would say
2 they're based upon data that I have analyzed, and
3 this would be similar to the analysis that I would
4 have used, but Dr. Olsen would be perfectly
5 competent to make the graph and easily could have.

03:09PM

6 Q Is it your understanding, sir, that Dr. Olsen
7 is going to be the witness, as opposed to yourself,
8 who is going to sponsor exhibits that look like what
9 we have here in Exhibit No. 11?

10 MR. PAGE: Are you referring to any
11 specific exhibit or all of them?

03:09PM

12 MR. GEORGE: Here's the dilemma I have,
13 David. I got this as part of Olsen and not Fisher.
14 There seems to be an obvious connection in terms of
15 the work product, and if there is something that
16 this witness is going to sponsor that is similar to
17 anything in Exhibit No. 11, I want to explore it
18 with him. So I'm a little bit at a dilemma of
19 knowing what you intend to have him sponsor.

03:09PM

20 A Mr. George, it would be my impression that I
21 would sponsor the chemical data as it relates to the
22 cores.

03:10PM

23 Q Okay. So you would sponsor, for example, the
24 bottom slide on Page 2853. Is that an example of
25 what you are talking about?

03:11PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A That could be an example of it, yes.

2 Q Okay. Tell me who determined the units for
3 that slide in terms of milligrams per kilogram per
4 dry weight of phosphorus for purposes of making this
5 comparison.

03:11PM

6 A Okay. Those would have been determined in the
7 sediment analysis. So they would have been from
8 Core 1, Core 1 sediment analysis for phosphorus.

9 Q I think we're miscommunicating, and it's
10 probably my fault. The actual reported
11 concentration would come from the analysis of the
12 sediment; correct?

03:11PM

13 A That's correct.

14 Q But someone made the determination to plot
15 these based on 200 milligram per kilogram units;
16 correct?

03:11PM

17 A I believe the spreadsheet may have made that
18 decision that these -- the plotting program would
19 have determined the span of the data and made an
20 initial assessment as to an appropriate span to
21 incorporate all the data. Then it might have
22 been -- the scale might have been changed so that
23 the data was all represented within the field of the
24 graph.

03:12PM

25 Q Why on the slide that we're discussing on

03:12PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Exhibit No. 11 is there -- are there no data points
2 between 1954 and 1969?

3 A You mean in the sediments?

4 Q Yes, sir.

5 A Because -- I'm not sure. 03:12PM

6 Q There should be -- you have data --

7 A I think there should be points there. This
8 may have been generated before all the data was
9 back. There could have been a number of reasons for
10 that. So this would not be the final exhibit. The 03:12PM
11 final exhibit would incorporate all the data as we
12 have it, as I have it.

13 Q Can you explain for me, sir, why on this
14 particular graph the broiler sales in the watershed
15 went up from 1997 to 2002 and the phosphorus in the 03:13PM
16 Tenkiller sediment went down?

17 A Okay. I'd say that overall, the overall trend
18 is that they -- it goes up, and if you're trying to
19 look at any given set of a couple of analyses,
20 couple of years, it might go up, it might go down, 03:13PM
21 but the overall trend is up. If I were modeling the
22 data, if I modeled the data, the data would be
23 modeled as a monotonically increasing function.

24 Q But if those two criteria --

25 MR. TUCKER: As a function of a -- what was 03:13PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the word?

2 A It would continue to increase.

3 MR. TUCKER: What was the word you used?

4 A Monotonically.

5 MR. TUCKER: Really?

03:13PM

6 A Increasing in a single manner.

7 Q Dr. Fisher, if those two variables were

8 related to one another, broiler sales in the

9 watershed and phosphorus concentration in Tenkiller

10 sediments, when the broiler population went up

03:14PM

11 between '97 and 2002, you would expect the

12 phosphorus concentration to likewise increase;

13 correct?

14 A Not necessarily.

15 Q Why not?

03:14PM

16 A Because this has to do with the flux of that

17 material into the lake.

18 Q Well, how did you control for that in your

19 analysis, the flux?

20 A In this particular analysis, I wouldn't have

03:14PM

21 controlled for it. You would simply take a look at

22 this type of graph and look at discharge in the

23 river and determine what the explanation might be

24 for a low data point. You could see, for example --

25 you would anticipate seeing a lower yield of waste

03:14PM

TULSA FREELANCE REPORTERS
918-587-2878

1 during a set of dry years, for example.

2 Q Well, have you reviewed the data to determine
3 whether there was a reduction in precipitation
4 between 1997 and 2002?

5 A I'm sure I have, and I can't remember. 03:15PM

6 Q Have you set that out in any analysis,
7 graphically or otherwise?

8 A No.

9 Q Okay.

10 MR. GEORGE: I'll pass the witness. 03:15PM

11 DIRECT EXAMINATION

12 BY MR. MCDANIEL:

13 Q Dr. Fisher, Scott McDaniel representing
14 Peterson Farms. Let's look back, sir, at Exhibits 9
15 and 10. That includes what are represented as 03:15PM
16 populations for humans, broilers, layers, et cetera,
17 other livestock. What attempts were made to
18 standardize these populations in order to graph them
19 together?

20 MR. PAGE: Object to the form. 03:16PM

21 A What do you mean by standardize, Mr. McDaniel?

22 Q You told me on Exhibit 9 that the magenta line
23 for broilers is broiler sales; is that right?

24 A That's correct.

25 Q Okay. How long is a broiler actually a 03:16PM

TULSA FREELANCE REPORTERS
918-587-2878

1 resident of the Illinois River watershed?

2 A About six weeks today.

3 Q Okay. We're not harvesting humans; they're
4 not livestock. Humans, we anticipate, live there
5 twelve months a year; correct? 03:16PM

6 A That's correct.

7 Q Okay. So this graph is treating sales of
8 chickens that are there for only five weeks as a
9 comparison of humans that live there twelve months a
10 year; is that true? 03:16PM

11 A That is not true.

12 Q Tell me why it's not true.

13 A Because that is the number of broilers that
14 live there during the period. The graph is meant to
15 look at the notion that within that calendar year 03:17PM
16 all of those broilers contributed waste.

17 Q But you would agree that if this chart is
18 going to compare apples to apples, it should
19 evaluate each of these different species according
20 to what the constant inventory is of that species in 03:17PM
21 the watershed; correct?

22 A No.

23 Q Well, you claim 140 million broilers sold in,
24 I don't know, 2004, but in fact there were not 140
25 (sic) chickens creating waste twelve months a year 03:17PM

TULSA FREELANCE REPORTERS
918-587-2878

1 in that watershed; do you agree?

2 A Nor does this graph claim that there are.

3 Q But the humans on this graph we assume do
4 create waste twelve months a year; correct?

5 A That's correct. 03:18PM

6 Q All right. How many months a year do we
7 assume that cattle are in the watershed?

8 A Twelve months.

9 Q How about the swine?

10 A I don't think there's any specific -- I don't 03:18PM
11 have a specific knowledge about swine, but we would
12 assume that the swine are there for less than twelve
13 months.

14 Q Okay. How long are turkey flocks ruled over;
15 how many turkey flocks are in a year in a turkey 03:18PM
16 house?

17 A I think about one.

18 Q One?

19 MR. TUCKER: One what?

20 A One flock. I think that's right. 03:18PM

21 Q All right. How about pullets?

22 A Pullets, maybe two.

23 Q All right. How about layers?

24 A Layers, they're there for a year and then
25 changed out frequently. 03:18PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q All right. So you agree with me that the line
2 depicting broilers on Exhibit No. 9 to your
3 deposition is not represented in the same relative
4 units as humans or cattle or turkeys or swine?

5 MR. PAGE: Object to the form. 03:19PM

6 A Well, it's true, but it's kind of irrelevant
7 to the analysis because the notion that I'm looking
8 at is the amount of waste contributed by each of
9 these livestock entities in the course of a year.

10 Q Well, how can you calculate accurately the 03:19PM
11 waste for broilers unless you account for the sale
12 of broilers and then divide it by five or six, if
13 that's the number of flocks in a year?

14 A Look at it this way: If I go from 20 million
15 broilers in a year in sales to 140 million broilers 03:19PM
16 a year in sales, the amount of waste they produce
17 would increase by roughly a factor of seven.

18 Q But that's not -- this is not a waste chart;
19 this is a population chart. All right? You're not
20 comparing chicken sales to human sales, but the 03:19PM
21 number you put on here is chicken sales compared to
22 the static human population. Have I correctly
23 described what this chart depicts?

24 A The number I put on here is relevant to the
25 amount of waste produced by that entity in that 03:20PM

TULSA FREELANCE REPORTERS
918-587-2878

1 year. I'm looking at the change in waste. Every
2 chicken produces waste.

3 Q For a fifth or a sixth of a year; agreed?

4 A For roughly six weeks today.

5 Q Okay. 03:20PM

6 A So if you are trying to take a look, as you
7 pointed out, the human produces waste for twelve
8 months out of the year. So if I want to look at the
9 change in waste produced, the relative change in
10 waste produced, I need to look at the annualized 03:20PM
11 population of each.

12 Q Okay, and this chart doesn't do that for
13 broilers, does it?

14 A Yes, it does.

15 Q How is that an annualized population, Mr. 03:20PM
16 Fisher, if it reflects the amount of birds sold?

17 A Because those are the birds that have lived
18 their life, deposited their waste and been
19 harvested.

20 Q But they've only lived a six-week life. 03:21PM

21 A That's correct, but to look at annualizing the
22 waste, you need to look at relative change between
23 times, which is what the intent here was. What is
24 the change in phosphorus in a lake core; is it times
25 two or times three or times seven? You need to look 03:21PM

TULSA FREELANCE REPORTERS
918-587-2878

1 at the annualized integrated population of each one
2 of these species.

3 Q In order to compare all of these species and
4 graph them on the same graph, why didn't you come up
5 with a number of waste producing units per day in 03:21PM
6 the watershed instead of sales; wouldn't that have
7 been more appropriate to where all the species could
8 be charted on the same basis?

9 MR. PAGE: Object to the form.

10 A That work was being done and was not being 03:21PM
11 done by me.

12 Q Okay. You didn't undertake that, but someone
13 else did; correct?

14 A That's correct.

15 Q All right. When you described your 03:22PM
16 application of the sediment core data, you were
17 comparing it to charts like we see in Exhibits 9 and
18 10; in other words, you were comparing it to growth
19 in chickens and humans and cattle, I believe were
20 the three I heard you specifically state; correct? 03:22PM

21 A That's correct.

22 Q All right. When you said that -- let me
23 strike that. You're aware that the Illinois River
24 basin is experiencing -- erosion of stream banks is
25 occurring? 03:22PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: Object to the form.

2 A Yes.

3 MR. McDANIEL: What was the problem with
4 that, David?

5 MR. PAGE: Assumes facts not in evidence. 03:22PM

6 MR. McDANIEL: Well, okay. They're in
7 evidence now.

8 Q Did you attempt, sir, to determine the extent
9 to which stream bank erosion rates were affecting
10 the chemistry in the area? 03:23PM

11 A Stream bank erosion rates will affect the
12 chemistry of the sediments only to the extent that
13 the materials in those sediments were not put there
14 by animals, in this case principally chickens. So
15 if I was looking at phosphorus in lake sediments, 03:23PM
16 for example, the background would be stream bank
17 erosion without an extrinsic input of animal
18 nutrients, animal-based nutrients.

19 Q All right. In that statement are you saying,
20 sir, that all the soils that erode from stream banks 03:23PM
21 are influenced by the existence of poultry in the
22 watershed; is that your assumption?

23 A No.

24 Q All right. Well, the natural soils in the
25 watershed contain phosphorus; correct? 03:23PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A At low levels.

2 Q And contain metals; correct?

3 A At low levels.

4 Q All right. So to what extent, if any, did you

5 undertake to evaluate the increasing rate of stream 03:24PM

6 bank erosion as affecting the chemistry in the

7 sediment cores over time?

8 A By measuring the sedimentation rates and

9 looking at the concordance of chemical changes, we

10 can tell that whatever is contributing phosphorus, 03:24PM

11 copper, zinc and arsenic is not from a low level

12 source. It goes from a low point, which might be

13 background or something that -- equivalent to

14 background in the 1950's, to something that's much

15 higher. It's not stream bank erosion, which would 03:24PM

16 have been taking place at some level during the

17 entire history.

18 Q Well, we need to answer my question, sir. To

19 what extent did you evaluate the effect of the

20 increasing rate of stream bank erosion on the core 03:25PM

21 sediments?

22 MR. PAGE: Object to the form.

23 Q Either you did it or you didn't do it. Is

24 that a difficult question?

25 A Well, stream bank erosion is simply going to 03:25PM

TULSA FREELANCE REPORTERS
918-587-2878

1 be reflected by, in part, sedimentation rate.

2 Q Okay. Did you undertake any analysis of
3 stream bank erosion in reaching your conclusions?

4 A No.

5 Q All right. To what extent do your conclusions 03:25PM
6 drawing a relationship or attributing relationships
7 to the sediment core chemistry draw from an analysis
8 of the aging of septic systems within the watershed?

9 A To the extent I've taken a look at the human
10 population and discovered that the changes in 03:25PM
11 chemistry do not show the same proportional change.

12 Q Okay. My question wasn't the human
13 population, which would be the number of
14 waste-producing people. My question was about the
15 degradation of the waste handling systems in the 03:26PM
16 watershed over time. Did you consider that or not,
17 yes or no?

18 MR. PAGE: Object to the form.

19 A I considered it based upon the population
20 numbers and considered it to be trivial. 03:26PM

21 Q All right. On what basis did you conclude it
22 was trivial; what data led you to believe it was
23 trivial?

24 A My knowledge of the amount of phosphorus in
25 human waste, which is quite low, and it can't be 03:26PM

TULSA FREELANCE REPORTERS
918-587-2878

1 either -- it can't be responsible for the chemical
2 changes seen in the lake.

3 Q What information did you have relative to
4 contributions from septic systems in the watershed
5 that factored into your analysis?

03:26PM

6 A I think if I thought about this in the sense
7 of every septic system, every human being
8 contributed all of their waste to Lake Tenkiller, I
9 couldn't explain the chemistry.

10 Q To what extent did you consider increases in
11 industry that was reflected in discharges from point
12 sources over time?

03:27PM

13 A I think that's being considered independently
14 of my analysis.

15 Q Okay. So the conclusions you've drawn in the
16 relationship between the core chemistry and the
17 poultry population is without regard to point source
18 discharges; is that correct?

03:27PM

19 A I would say it's not in disregard of point
20 source discharges, but point source discharges would
21 be reflecting the transition from individuals from a
22 rural setting to a more urban one, going from septic
23 systems to POTW's, to publicly owned treatment
24 works, and it still would be the same for human
25 waste, and you could dump all the human waste you

03:27PM

03:28PM

TULSA FREELANCE REPORTERS
918-587-2878

1 wanted to into that system and you wouldn't change
2 the sediment chemistry in this way.

3 Q Okay. Dr. Fisher, my question was, your
4 relationship that you've offered in your opinions
5 between the sediment chemistry and the poultry 03:28PM
6 population, it either did or did not account for the
7 influences from POTW's, yes or no?

8 MR. PAGE: Object to the form.

9 A Well, I'm accounting for it by simply looking
10 at how much you could alter the chemistry from human 03:28PM
11 waste input, and you can't do it.

12 Q Did you graph the differences in chemical
13 outputs from the POTW's in the watershed over time
14 and compare it to the sediment core chemistry over
15 time? 03:28PM

16 A No.

17 Q Did you graph land use changes, in other
18 words, deforestation or urbanization in northwest
19 Arkansas against the sediment core chemistry?

20 A Did I graph it, no. Did I consider it, yes, 03:29PM
21 and in point of fact, the general land use has been
22 fairly stable with respect to open space versus
23 forest over the history of this watershed.

24 Urbanization has been increasing, but within the
25 watershed really sort of modestly so and only in the 03:29PM

TULSA FREELANCE REPORTERS
918-587-2878

1 farthest eastern part, so it's considered in that
2 sense.

3 Q All right. Let's be clear here. Is it your
4 testimony then that the urban growth in the eastern
5 part of the watershed has been modest?

03:29PM

6 A Well, it's my contention that the growth
7 within the eastern part of the watershed has not --
8 where it's reflected in human population, has not
9 impacted the human population within the watershed
10 tremendously.

03:29PM

11 Q Have you or anyone on the expert team that
12 you're a member of to your knowledge made any
13 attempt to quantify the increased sediment load
14 carried by the waters of the Illinois River as a
15 consequence of land use changes over time?

03:30PM

16 A Well, I have indirectly. If you look at the
17 sedimentation rates, they vary throughout the lake
18 but don't change substantially as a function of time
19 within the cores.

20 Q All right. You understood my question?

03:30PM

21 A I did, I did. I think what you're saying is
22 that the urbanization would impact sediment yield.

23 Q And has anyone tried to quantify that to your
24 knowledge?

25 A I didn't see any reason to since the

03:30PM

TULSA FREELANCE REPORTERS
918-587-2878

1 sedimentation rates appeared fairly stable from the
2 19 -- mid 1970's, late 1970's.

3 Q I'll get you out of here a lot faster if you
4 can answer yes or no, and that was a yes or no
5 question. 03:30PM

6 MR. PAGE: I'll object to that statement.
7 It's argumentative.

8 MR. McDANIEL: Well, we're in -- a yes or
9 no question is suitable to be answered with a yes or
10 no answer, and he can explain. It's non-responsive. 03:31PM

11 Q All right. I asked the question, sir, did
12 anyone on the plaintiff's expert team quantify the
13 effect of sedimentation from land use changes in the
14 watershed over time, yes or no, and then explain, if
15 you need to? 03:31PM

16 A No, and let me explain. In looking at the
17 sedimentation data in the cores, there did not
18 appear to be a profound change in sedimentation over
19 the period of records, say, from the mid 1980's
20 forward. It looks fairly stable. So we don't see 03:31PM
21 an -- what you would anticipate in an urbanizing
22 setting. If you indeed had substantial erosion
23 attendant to that development, then sediment
24 transport, you would see accelerating sedimentation
25 rates. Those don't exist. 03:32PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. McDANIEL: Let's change tapes.

2 VIDEOGRAPHER: We're now off the Record.

3 The time is now 3:32 p.m.

4 (Following a short recess at 3:32 p.m.,

5 proceedings continued on the Record at 3:39 p.m.) 03:39PM

6 VIDEOGRAPHER: We are back on the Record.

7 The time is 3:39 p.m.

8 Q Dr. Fisher, how did you arrive at these
9 poultry production numbers back over time?

10 A Okay. I explained that earlier to Mr. George, 03:39PM

11 but I'll be happy to discuss this again. These

12 numbers were abstracted from the U. S. Department of

13 Agricultural statistics reports that are described

14 in sort of the treatise list in my production. The

15 numbers of birds are -- were allocated to within the 03:39PM

16 Illinois River watershed based upon the relative --

17 the amount of pasture acreage within the watershed

18 compared to pasture acreage as a whole within a

19 county because the data is grained at the level of

20 counties. 03:40PM

21 Q Okay. In 1955, are you saying that you

22 undertook some process to determine pasture acreage

23 in 1955?

24 A As I recall, I did review the agricultural

25 statistics data on pasture versus forest. 03:40PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q In 1955?

2 A In 1955. As I recall, that's recorded, but
3 we're really using the current land use and land
4 cover data, but my recollection from reviewing the
5 pasture acreage that's reported is it's relatively
6 stable.

03:40PM

7 Q All right. Let me say back to you what I
8 think I heard and see if I've got it correctly.
9 Based upon recent analysis, a determination was made
10 of percentage of pasture inside and outside of the
11 watershed for the counties in the watershed?

03:41PM

12 A That's correct.

13 Q And then that ratio or percentage was then
14 applied to the county poultry sales data back over
15 time?

03:41PM

16 A That's correct.

17 Q Okay. Were any efforts made to validate that
18 those ratios based upon current land uses would be
19 valid when applied to poultry sales numbers from
20 1955?

03:41PM

21 A Yes, in the sense that I took a look at the
22 reported pasture acreage given in the agricultural
23 statistics data.

24 Q From 1955?

25 A My recollection is there's 1955 data. I could

03:41PM

TULSA FREELANCE REPORTERS
918-587-2878

1 check that for you, Mr. McDaniel, but I know there's
2 data in other years, and it appears to be quite
3 stable.

4 Q Okay. So implicit from your statement is that
5 the acreage of pasture in the watershed hasn't
6 changed to any substantial degree from 1955 to the
7 present?

03:42PM

8 A Yeah. What we're doing here or we're really
9 looking at cleared area because you can't tell, in
10 lieu of that data, whether it's actually a pasture
11 or just open space. You're looking at open air,
12 non-forested to forested land is what we're looking
13 at, and that appears to be stable in this watershed
14 over the period of record.

03:42PM

15 Q Okay. How did you in your graphing of -- or
16 excuse me, in your interpretation of animal
17 population being representative of animal waste
18 production, how did you account for improvements in
19 poultry husbandry since 1950?

03:42PM

20 A For poultry husbandry, could you define that?

03:42PM

21 Q For instance, I believe, as you said, if it
22 takes more or less six weeks to raise a broiler
23 chicken today, how long did it take to raise a
24 broiler chicken in 1955?

25 A Longer, and I don't remember the data. I've

03:43PM

TULSA FREELANCE REPORTERS
918-587-2878

1 seen that data. It took longer than, and that's why
2 these are annualized numbers.

3 Q Well, what I understand from Exhibit 9, that
4 chicken line is sales?

5 A Correct. 03:43PM

6 Q Okay. So if a poultry house, assuming the
7 same size poultry house existing today, was the same
8 size poultry house in 1955, you could produce
9 significantly more chickens out of that same house
10 in a year today than you could in 1945; do you 03:43PM
11 agree?

12 A Yes.

13 Q All right. How did you account for that in
14 your application of this data to the waste
15 generation from poultry over time? 03:44PM

16 A Well, in this case, and I think this kind of
17 bears on the last line of questioning. What I'm
18 looking at here are the changes, the relative
19 changes in abundance of total number of animals in
20 ton and trying to relate that to the proportional 03:44PM
21 change in sediment chemistry over the same time
22 frame.

23 Q I understand. You said animals, but in
24 chickens it's not -- let's be clear. It's animals
25 sold in a year? 03:44PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A That's right. So this would actually be a
2 little bit lower number than the actual number of
3 animals. Basically only the ones that we account
4 for for broilers are the ones that were sold.

5 Q To what extent is the slope on this graph, 03:44PM
6 sloping up, reflecting increased production, to what
7 extent is that a product of improved poultry raising
8 techniques?

9 A I wouldn't be able to make an assessment of
10 that. 03:45PM

11 Q All right. To what extent has the changes in
12 poultry feed changed the character of poultry manure
13 over this time period?

14 A Poultry feed has always been amended in a
15 number of ways. It would be speculation on my part 03:45PM
16 to tell you how it's changed in detail, but the feed
17 is probably more phosphate rich today than it was in
18 1955.

19 Q Well, in fact, you are not the expert who is
20 developing opinions about the actual waste 03:45PM
21 production of poultry over time; did I understand
22 that correctly?

23 A That's correct.

24 Q So you're not -- at the preliminary injunction
25 hearing, you're not going to offer an opinion about 03:46PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the actual waste produced by poultry over time in
2 the Illinois River watershed; is that true?

3 A I believe that is true. I'm simply going to
4 be showing relationships between abundances of
5 organisms and chemical changes as one aspect of
6 testimony.

03:46PM

7 Q All right. Tell me, sir, what year was it
8 that the dam at Lake Francis was breached.

9 A I believe it's 1991.

10 Q And what was the effect on the Illinois River
11 below that dam immediately subsequent to the dam
12 breaking, and by effect, I mean water quality
13 effect?

03:46PM

14 A I don't know as we sit here. I'd suspect that
15 the instant effect would be to having removed a trap
16 for materials, that water quality may have degraded
17 below the dam.

03:46PM

18 Q And so tell me how that incident and its
19 effect was accounted for in your analysis of the
20 sediment core data.

03:47PM

21 A We don't need to account for it because any of
22 the waste that would be present in Lake Francis, the
23 waste that would have been captured still would have
24 been related to waste disposal within the watershed,
25 Lake Francis part of the watershed.

03:47PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q But you'd have to acknowledge, wouldn't you,
2 Dr. Fisher, that that dam breaking would have
3 created a significant slug of phosphorus and other
4 substances coming down the Illinois River?

5 A I think that assumes facts that we haven't 03:47PM
6 looked at here.

7 Q Okay. You haven't evaluated whether my
8 statement is -- or you haven't done an evaluation
9 such that you would -- you can agree or disagree
10 with my statement; is that true? 03:48PM

11 A And I'm not sure it can be done. I'm not sure
12 there's enough water quality data to be able to do
13 that.

14 Q All right. Have you reviewed studies related
15 to Lake Francis? 03:48PM

16 A Yes.

17 Q And have you reviewed any of the studies
18 regarding the sediment cores in Lake Francis?

19 A You'd have to point me to the specific
20 studies. 03:48PM

21 Q Do you recall having reviewed any studies
22 related to the sediment cores in Lake Francis?

23 A I do not.

24 Q All right. Let's change subjects briefly for
25 all of us. Dr. Fisher, do you agree that there is 03:48PM

TULSA FREELANCE REPORTERS
918-587-2878

1 considerable diversity among the soils in the
2 Illinois River watershed?

3 A With respect to what, Mr. McDaniel?

4 Q Soil series. How many different soil series
5 are there in the Illinois River? 03:49PM

6 A Oh, there are quite a few names of soils.

7 Q Okay. Quite a few is five or is it 50?

8 A No. It's like a hundred plus.

9 Q All right. A hundred plus. Would you agree
10 that there's a considerable variance in the depth of 03:49PM
11 soils across the watershed?

12 A Yes.

13 Q How about differences in the permeability of
14 the soils in the watershed from area to area?

15 A I think that the soils, as you would map their 03:49PM
16 physical properties, and that's been done in part by
17 Dr. Storm in a 1996 report that was produced to you,
18 the physical properties show, with respect to runoff
19 versus infiltration, show a lot less variability.

20 Q Let me show you a report titled Arkansas Water 03:49PM
21 Resources Center Application of Neurophysic
22 Techniques to Predict Groundwater Vulnerability in
23 Northwest Arkansas. I got it from your materials
24 and the first page is PI Fisher 700. Do you
25 recognize that? 03:50PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I do.

2 Q All right. Could you hand it back? I just
3 need to know if you recognize it as in your
4 materials.

5 MR. PAGE: Are you going to examine him 03:50PM
6 about the document?

7 MR. McDANIEL: Yeah.

8 MR. PAGE: Well, then I suggest you mark it
9 and put it into evidence.

10 MR. McDANIEL: Okay. You can suggest that. 03:50PM
11 I identified it by Bates number.

12 Q There are a couple of statements -- are you
13 familiar with the Arkansas Water Resource Center?

14 A Am I familiar with them? Do I know where they
15 office? Yes. Do I know who one of the directors 03:50PM
16 is? Yes.

17 Q Well, you are familiar with the entity or
18 organization?

19 A Yes.

20 Q I want to read you some comments and find out 03:50PM
21 if you agree or disagree with these statements.
22 Depth of the soil profile, and I'm reading from
23 Bates number 726.

24 MR. PAGE: Scott, why don't you give him a
25 copy of the document so he can read along so there's 03:51PM

TULSA FREELANCE REPORTERS
918-587-2878

1 no confusion?

2 MR. McDANIEL: I don't have one, David.

3 MR. PAGE: Well, I'm sorry you don't have
4 one. You had this 21 days before his deposition.

5 Can we make a copy and let him then read along with 03:51PM
6 you so there's no confusion?

7 MR. McDANIEL: If it's a problem, I'll be
8 glad to assist the witness, if he's confused. I
9 don't want to ask him confusing questions, but I
10 think I can read from the document and ask him 03:51PM
11 questions.

12 MR. BULLOCK: You've objected and
13 instructed witnesses not to answer when we've done
14 that.

15 MR. McDANIEL: And you're free to do so 03:51PM
16 here, Louis. I haven't -- never instructed a
17 witness not to answer based upon what you've just
18 said, okay, but if you want to do it, that's fine.

19 MR. BULLOCK: We'll check the Record on
20 that. 03:52PM

21 MR. McDANIEL: I think the judge made it
22 clear to both of us when that --

23 MR. BULLOCK: I think he made it clear to
24 you.

25 MR. McDANIEL: Okay. Oh, it wasn't clear 03:52PM

TULSA FREELANCE REPORTERS
918-587-2878

1 to you?

2 MR. BULLOCK: To your conduct.

3 MR. McDANIEL: Yeah, okay. Well, then,
4 make your objection if you'd like.

5 Q All right. The author states, the depth of 03:52PM
6 the soil profiles was estimated from the soil series
7 description for the solum thickness. What is solum;
8 can you tell me what solum means?

9 MR. PAGE: Object to the form.

10 A I would need to read what you are reading. 03:52PM

11 Q All right. Read that, what I've marked right
12 there.

13 A Okay. If I recall correctly, solum refers to
14 that zone of the soil that's sort of truly soil and
15 not just kind of regular, the underlying weathered 03:53PM
16 but not solified material being derived from the
17 bedrock. I think that's correct.

18 Q Okay. Thank you. And I don't want to be
19 unfair, Dr. Fisher. You're not a soil scientist?

20 A I am not. 03:53PM

21 Q I'm sorry. I spoke over you. What was your
22 answer?

23 A I am not a soil scientist.

24 Q Okay. It says about 83 percent of the study
25 area has deep or very deep soil profiles. Deep soil 03:53PM

TULSA FREELANCE REPORTERS
918-587-2878

1 profiles are found all over the watershed, whereas,
2 very deep soil profiles occur along the stream
3 valleys. Do you agree with that statement?

4 A Okay. I don't know whether I can agree or
5 disagree with that statement because I don't know 03:53PM
6 what watershed you are referring to. My
7 recollection of that study is that it looks at a
8 number of subwatersheds, and I don't know whether
9 that statement is describing the entire watershed or
10 not. 03:54PM

11 Q All right. With regard to the Illinois River
12 watershed, do you agree with that statement?

13 MR. PAGE: Object to the form.

14 Q Or not?

15 A I don't know if I agree with it or not. I've 03:54PM
16 not made an independent assessment of soil
17 thickness. They have. So within -- I don't know
18 whether I agree with their assessment that thick or
19 very thick soils are present because I don't know
20 what they're defining necessarily as thick or very 03:54PM
21 thick soils in terms of depth.

22 Q All right. You have not undertaken analysis
23 of soil depth across the Illinois River watershed.
24 Did I just hear that?

25 A Yes, you just heard that, and it's really 03:54PM

TULSA FREELANCE REPORTERS
918-587-2878

1 immaterial to the analysis that I've presented
2 because soils are significant here as they permit
3 infiltration or promote runoff, whether there's a
4 higher ratio of runoff to infiltration for one thing
5 and, number two, the soils themselves, whether they
6 are thick or thin, are underlaine by a highly
7 fractured and Karst bedrock, which is a direct
8 conduit from surface materials to water. In the
9 Oklahoma portion of this watershed, this has been
10 classed as a very high sensitivity aquifer to
11 surface contamination.

03:55PM

03:55PM

12 Q Would you agree that the depth of soil is one
13 factor affecting the ability for surface
14 contaminants to reach groundwater?

15 A One factor.

03:55PM

16 Q Would you agree that the type of soil is a
17 factor affecting the ability of surface live
18 contaminants to reach groundwater?

19 A What do you mean by type of soil; you mean by
20 the soil series name?

03:56PM

21 Q If I want to say the different kinds of soil
22 out there, what term should I use for that; is soil
23 series, is that the term you prefer to use?

24 A That seems like a reasonable -- generally soil
25 scientists refer to these as soil series, and soil

03:56PM

TULSA FREELANCE REPORTERS
918-587-2878

1 series are defined by thickness, also by slope, by
2 parent material, a diversity of things that define a
3 soil series. So it's things that may have the same
4 parent material but different slopes. Could be two
5 different soil series and behave mechanically
6 similarly.

03:56PM

7 Q But the -- would you agree that the soil
8 series is one factor that can affect the ability for
9 surface-applied contaminants to reach groundwater?

10 A Yes.

03:56PM

11 Q And would you agree that different types of
12 surface contaminants have different potential to
13 reach to the groundwater through the soil?

14 A In a Karst terrain, I would say that all
15 contaminants are treated equally by an open channel.

03:57PM

16 Q Well, but the Karst isn't referring to the top
17 soil, is it, sir; it's referring to the geology
18 underlying the top soil?

19 A It's referring to the geology underlying the
20 top soil and to the top soil as this is a mantled
21 Karst system. The soils are residuum soils that
22 have been formed in place largely by weathering,
23 except for those soils that are present within
24 alluvial deposits in stream valleys.

03:57PM

25 Q But if I just took a cubic foot of soil and

03:57PM

TULSA FREELANCE REPORTERS
918-587-2878

1 put different contaminants on the surface of that
2 soil, the potential for each different -- the
3 potential can be different for different pollutants
4 to move through that soil cubic foot; right?

5 A So tell me, and this is a system in which 03:58PM
6 you're looking at a very small piece of soil that
7 may not be reflective of a larger area?

8 Q I'm not asking you about the watershed. I'm
9 trying to understand the concept. I understand it's
10 a concept and, that is, different chemical, 03:58PM
11 biological constituents on the surface of soil have
12 different potentials to move through the soil as a
13 general proposition; do you agree with that
14 statement?

15 A Yes, I do agree with that statement. 03:58PM

16 Q And I assume there's a host of factors that
17 can affect or create the differences in the
18 potential for movement, such as whether that
19 constituent is in solution and water would make a
20 difference versus a particle; would you agree? 03:59PM

21 A It depends on the type of soil but, yes, in
22 general, one would agree that particles and
23 materials in solution would have different migration
24 potential through a coherent and unbroken soil.

25 Q What expertise do you have, if any, in the 03:59PM

TULSA FREELANCE REPORTERS
918-587-2878

1 migration of bacteria through soil?

2 A Well, I know bacteria will go through holes.

3 Q Okay. I'm not sure that answered my question.

4 Do you have research experience in the movement of

5 bacteria through soils?

03:59PM

6 A I've looked at the movement of particles

7 through soils, which would emulate bacteria moving

8 through soils.

9 Q Do you understand that different kinds of

10 bacteria have a different amount of, let's say,

04:00PM

11 stickiness?

12 MR. PAGE: Object to the form.

13 A I'm not a microbiologist.

14 Q Okay. So you can't characterize the ability

15 of different bacteria to move through the same soil

04:00PM

16 matrix?

17 MR. PAGE: Object to the form.

18 Q Can you?

19 A I can tell you that bacteria can move through

20 a hole.

04:00PM

21 Q Can you tell me the difference between the

22 ability of E. coli to move through the same soil

23 versus Salmonella to move through that same soil;

24 can you tell me the difference?

25 MR. PAGE: Object to the form.

04:00PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Through a soil?

2 Q All things being the same, can you tell me the
3 difference between the potential movement of E. coli
4 and Salmonella?

5 MR. PAGE: Same objection. 04:00PM

6 A I'm not a microbiologist. I would treat them
7 as particles. I can say that there's published work
8 that shows in Karst terrain, particles and bacteria
9 can actually move faster than dissolved materials.

10 Q The -- would you agree that a greater depth of 04:00PM
11 soil provides greater or reduces the risk that
12 surface-applied contaminants can reach the
13 groundwater?

14 A No. That would have to be assessed within a
15 number of other factors for a site. 04:01PM

16 Q So would that be a site specific condition one
17 would have to evaluate in order to answer that
18 question?

19 A No.

20 Q You can answer it for the whole watershed? 04:01PM

21 A Well, I mean the watershed itself has been --
22 in the Oklahoma side has been treated as a high risk
23 aquifer. So if you are taking a look at what's at
24 risk, if groundwater is at risk, it really wouldn't
25 make a whole lot of difference what's different at 04:01PM

TULSA FREELANCE REPORTERS
918-587-2878

1 one site from another because you're looking at the
2 ensemble of the watershed and how it behaves.

3 Q Is every land application area in the
4 watershed causing pollution of groundwater?

5 A I would say that it is my opinion that that is 04:01PM
6 true.

7 Q What are you basing that opinion on?

8 A The pervasiveness of land application of
9 poultry waste and the high incidence of reported
10 historic groundwater contamination in various 04:02PM
11 reports and the incidence of groundwater
12 contamination in our reports. So every land
13 application has a risk of contaminating the
14 groundwater, and that risk here is substantial
15 because of the underlying Karst nature of the 04:02PM
16 aquifer.

17 Q I think I asked the question, is every land
18 application area in the watershed causing
19 contamination of the groundwater? If I didn't ask
20 that before, then let me ask that question to you. 04:02PM

21 MR. PAGE: Object to the form.

22 Q Let me restate it. Is every land area where
23 poultry litter has been applied in the Illinois
24 River watershed a source of contamination of
25 groundwater? 04:03PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: Object to the form.

2 A Every place it's been applied is a potential
3 source of contamination of groundwater.

4 Q Sir, I didn't ask potential. I said is it, is
5 it a source? 04:03PM

6 A I think I've answered your question.

7 Q Do you know the difference between is and
8 potential? Potential to me, and you can correct me
9 if you wish, potential means it could be. My
10 question is, sir, is it in fact a source of 04:03PM
11 pollution; every land application site in this
12 watershed, is it a source of pollution to
13 groundwater in this watershed?

14 A Every land application in this watershed has
15 the potential to pollute groundwater. 04:03PM

16 Q All right. That's non-responsive. Did you
17 not understand my question?

18 A I understood your question.

19 Q Then I require an answer, sir. You can say
20 yes, no, I don't know, but you have to answer the 04:04PM
21 question I asked.

22 A Because of the underlying Karst nature of
23 this, it would be my opinion that every land
24 application within this watershed has a potential to
25 pollute the groundwater. That's my answer, and 04:04PM

TULSA FREELANCE REPORTERS
918-587-2878

1 that's responsive to your question.

2 Q No, sir. Sir, have you made a finding that
3 every land application area for poultry litter in
4 this watershed is in fact causing pollution of
5 groundwater, yes or no? 04:04PM

6 A I have not made that finding.

7 Q Let me hand you what I've marked as Exhibit 12
8 to your deposition. Do you recognize this as a
9 document you produced, Dr. Fisher?

10 A Yes, I do. 04:05PM

11 Q All right. Tell me what this exhibit is.

12 A Okay. This is a sample of a spring. It
13 appears to be from property owned by Bev and W. A.
14 Saunders. It's collected in July of 2006.

15 Q It's okay. You don't have to give -- just 04:05PM
16 generally what they are. You don't have to start
17 reading the info on it. Is this part of the
18 groundwater sampling data summaries that you
19 referred to earlier in your deposition?

20 A Yes. This is from -- yes. 04:05PM

21 Q All right.

22 A This is for a spring.

23 Q All right. Look at page Bates number 5450 and
24 this -- you believe this to be a spring on the
25 Saunders property based upon the information on the 04:06PM

TULSA FREELANCE REPORTERS
918-587-2878

1 document?

2 A I do.

3 Q All right. Look at the spring, the water
4 sample from the spring. What did this spring
5 reflect as far as bacterial presence?

04:06PM

6 A Compared to the other samples, high bacterial
7 counts, including total coliform, fecal coliforms,
8 E. coli and Terracoccus and a hit of Salmonella.

9 Q All right. In your analysis, you would call
10 this a bacterial contaminated spring, just to use a
11 general expression; is that okay?

04:06PM

12 A Yes.

13 Q Do you have an opinion, sir, what is the
14 source of the bacteria in this spring?

15 A I would have to look at all the details of the
16 conditions of sampling as we discussed. I can't
17 remember a specific spring incident.

04:06PM

18 Q Did -- so as part of your opinions, you didn't
19 look at any place where bacteria was found to draw a
20 conclusion about what the source was?

04:07PM

21 A No. My opinion is that bacterial
22 contamination is pervasive within the watershed.

23 Q All right, but my question was -- let me put
24 it differently. Is it your intention to testify to
25 the court that the bacterial contamination in the

04:07PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Saunders spring is from the land application of
2 poultry litter?

3 A It may be pending review of other data that
4 surrounds this sample.

5 Q Is that your opinion today? I need to know 04:07PM
6 what your opinion is today.

7 A I don't necessarily have a specific opinion
8 concerning the source of these bacteria in the
9 spring because I would need to review the other data
10 that surrounds this particular sample. 04:07PM

11 Q All right.

12 A I do note that 17 beta-Estradiol seems to be
13 present in high concentrations. That's potentially
14 indicative of poultry waste.

15 Q If -- hypothetically if it was made known to 04:08PM
16 you that there was manure in this spring, how would
17 that affect your analysis?

18 A Well, if it was poultry manure, it would
19 confirm my analysis.

20 Q All right. Thanks for helping me to be more 04:08PM
21 precise. Cattle manure?

22 A If it could be demonstrated to me that there
23 was cattle manure that had been applied here or was
24 present in the spring, then I would eliminate this
25 from my -- from consideration. 04:08PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q All right. Let's --

2 A But I wouldn't necessarily do that. I would
3 say that there would be a cattle manure component
4 present, but there might be other data that suggest
5 a poultry manure presence, and so I would say that 04:08PM
6 there's cattle manure present. There might be other
7 information that suggests a poultry contribution.

8 Q Turn over to Bates number 5453 of the same
9 exhibit. Are you there with me?

10 A Yes, I am. 04:09PM

11 Q All right. What does this sheet reflect?

12 A This sheet reflects an analysis of the
13 Saunders well. So from looking at the latitudes and
14 longitudes, these are pretty close together. That's
15 what it reflects in that analysis. 04:09PM

16 Q All right. What does the bacterial analysis
17 of the Saunders well show?

18 A It shows it's non-detect.

19 Q All right. So this would be -- can we call
20 this a non-bacterial contaminated water well sample? 04:09PM

21 A Well, we don't have any detected bacteria.
22 There may be other chemical or biological data that
23 I've not considered that someone else has considered
24 that would suggest poultry contribution to this, but
25 I would consider this not to contain any detected 04:10PM

TULSA FREELANCE REPORTERS
918-587-2878

1 bacteria.

2 Q All right. Do you know whether or not the
3 Saunders land applied poultry litter at this
4 property?

5 A Right now I do not know specifically. That, 04:10PM
6 in fact, might not be relevant.

7 Q It might not?

8 A No.

9 Q If this case is about the land application of
10 poultry litter, the fact that their water well is 04:10PM
11 not contaminated is not a relevant consideration in
12 your mind, sir?

13 A No, no. If their water well being not
14 contaminated if they applied poultry litter, this
15 result would say, at least with respect to the 04:10PM
16 instantaneous sample that was taken, no bacterial
17 contamination was found. That's what it says.

18 Q So you're saying maybe the next day bacteria
19 could be present?

20 A It's possible. 04:11PM

21 Q All right. These water well samples that you
22 are relying on for your opinion, how many times were
23 these wells sampled?

24 A Once.

25 Q All right. Don't they all suffer from that 04:11PM

TULSA FREELANCE REPORTERS
918-587-2878

1 same problem then? One sample is inadequate to
2 characterize what's in that well?

3 A Well, one sample without detection doesn't say
4 that it could never happen, but if you have a
5 detection, it says it did happen. 04:11PM

6 Q One time?

7 A One time.

8 Q According to EPA guidelines, how many samples
9 are required for compliance with the drinking water
10 standards? 04:11PM

11 A I don't know as we sit here today.

12 Q If you assume with me that the Saunders do
13 land apply poultry litter, and I can represent it's
14 very much in evidence in other depositions that they
15 do, they're a poultry grower, then you would have to 04:12PM
16 agree that at least in this instance, this poultry
17 grower land applying poultry litter has not
18 contaminated his groundwater well based upon the
19 data you have?

20 A I would conclude that this poultry grower who 04:12PM
21 applies litter, on the day that this analysis was
22 made, there was no contamination found in their
23 well.

24 Q Sir, are you familiar -- well, this document
25 came from your documents, PI Fisher 2644, 04:13PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Environmental and Hydrologic Setting in the Ozark
2 Plateau Study Unit, Arkansas, Kansas, Missouri and
3 Oklahoma, U. S. Geologic Society?

4 A I've looked at that document, yes.

5 Q Okay. Is the USGS a reliable organization? 04:13PM

6 A They are a reliable organization.

7 Q I see you wanting to jump ahead to the pages
8 I've marked, and I haven't really asked you to do
9 that, so let me have the document back, please, sir.

10 That's the wonder of depositions. I get to ask 04:13PM

11 questions. Does this characterization of Ozark
12 Plateau's study unit in Arkansas, Kansas, Missouri
13 and Oklahoma, does it include the Illinois River
14 watershed area?

15 A It does. 04:13PM

16 Q It refers to -- excuse me. My eyes aren't
17 working so well-- alfisol and utilisol? I'm not
18 sure I'm pronouncing either word correctly. What
19 are those?

20 A They are major types of soils. 04:14PM

21 Q Okay. It states on Bates number 2652 that
22 alfisol and utilisol soil types underneath most --
23 underlie most of the study unit. These soils are
24 moderately to deeply weathered and have a wide range
25 of hydraulic properties. Would you agree that that 04:14PM

TULSA FREELANCE REPORTERS
918-587-2878

1 statement is applicable to the Illinois River
2 watershed?

3 MR. PAGE: I'll object again, examining the
4 witness on an exhibit that he's not even given a
5 copy of.

04:14PM

6 MR. McDANIEL: I understand your objection.

7 A You'd need -- this is a very large area that
8 incorporates parts of Kansas, Missouri, as well as
9 northwest Arkansas, so it's is a regional study.

10 The specific area that includes the Illinois River

04:15PM

11 watershed is the Springfield Plateau region, which
12 is underlaine by the Boone limestone. So what would
13 be relevant is not that statement, which is talking
14 about something that's thousands of square miles in
15 area, but rather a description of the hydraulic
16 properties within the Illinois River watershed.

04:15PM

17 Q So is the statement about the soils having a
18 wide variation of hydraulic properties, is that true
19 in the Illinois River watershed or is that not true?

20 A You have to define what wide variation and
21 hydraulic properties are. There's certainly
22 variation of hydraulic properties.

04:15PM

23 Q Let me let you look at Page 2663, and it's a
24 Figure 6. It says distribution of sink holes in
25 southern Missouri and northern Arkansas, and tell

04:15PM

TULSA FREELANCE REPORTERS
918-587-2878

1 me, sir, when I hand this to you, if you would agree
2 that the primary area of the Illinois River
3 watershed showing on this chart is in the area
4 designated as sink holes are less than one per 100
5 square miles. Tell me if I'm reading that correct. 04:16PM

6 A Yes, you have read this graph quite correctly.
7 That portion of Karst within the Illinois River
8 watershed is less heavily developed than that
9 portion of Karsted area in the southwest central
10 Missouri. It is Karsted nonetheless. 04:16PM

11 Q All right. Would you agree, Dr. Fisher, that
12 spring water samples in the Illinois River watershed
13 do not necessarily reflect the water quality at the
14 depths from which people draw domestic drinking
15 water? 04:17PM

16 A I'm not sure I completely agree with you, that
17 it doesn't necessarily reflect the depths from which
18 most people might draw drinking water. There are
19 individuals within the Illinois River watershed who
20 were at one time dependent upon springs for their 04:17PM
21 water supply.

22 Q Let's talk about the aquifers in the watershed
23 from which domestic water wells are completed.
24 You're not going to create the impression for the
25 judge there's just one interconnected pool 04:17PM

TULSA FREELANCE REPORTERS
918-587-2878

1 underlaying this entire watershed, are you?

2 A Well, I'll try to create for the judge the
3 appropriate impression, that we have an interchange
4 between groundwater and surface water that's well
5 known and well documented within the Illinois River
6 watershed in the Boone-St. Joe aquifer that is above
7 the Chattanooga shale.

04:17PM

8 Q The faults that create some of the pathways
9 also create some barriers to flow, don't they, Dr.
10 Fisher?

04:18PM

11 A They can.

12 Q All right. So within the aquifer there are
13 faults that create pathways and there are also
14 physical barriers to water flowing beneath the
15 surface?

04:18PM

16 A All the literature that I have reviewed has
17 not treated the aquifer in that way with substantial
18 barriers to flow across fault plains in the
19 subsurface, one. Number two, faults that would pass
20 through a carbonate, especially a carbonate at this
21 shallow depth interacting with rainfall and
22 groundwater, are going to become enlarged.

04:18PM

23 Q You've done a lot of work in the environmental
24 litigation arena as a consultant or testifying
25 expert; correct?

04:19PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I guess you have to define a lot of work, but
2 I've worked in that area.

3 Q So if I use the word plume of contamination,
4 you understand what the word means; true?

5 A I believe I do. 04:19PM

6 Q All right. In the Illinois River watershed,
7 you have not defined a plume of bacterial
8 contamination from poultry litter?

9 A That's correct, and, in fact, trying to map
10 something akin to a plume that you frequently see in 04:19PM
11 environmental studies would be very difficult to do
12 in a Karst terrain since features -- the matrix
13 itself, the rock itself has generally fairly low
14 permeability and really fairly low porosity. Most
15 of the porosity in the system, the so-called 04:19PM
16 secondary poro floor space, fractures in the
17 solution, enlarged fractures, and so one of the
18 conundrums in any sort of environmental study that
19 involves Karst or fractured bedrock, even in
20 fractured granite, is trying to find the plume. 04:20PM
21 That's very commonly observed. You can't find the
22 plume but you find contamination in many places.

23 Q Well, and so that we properly characterize
24 this, your exhibit -- I'm sorry, the map of the
25 water wells, Exhibit 6, if you have that in front of 04:20PM

TULSA FREELANCE REPORTERS
918-587-2878

1 you, sir -- would you find it, please?

2 A Yes.

3 Q All right. This million acre -- I read this
4 this way: This million acre watershed that
5 plaintiffs or the State has sampled, you have found
6 nine locations with a detection of bacteria in the
7 water. I think you've covered that with Mr. George.

04:21PM

8 MR. PAGE: Object to the form.

9 A Well, that mischaracterizes the data.

10 Q Let me restate it if I mischaracterized it.

04:21PM

11 Okay? I realize how I may have asked an improper
12 question. This well -- excuse me. This Exhibit 6
13 reflects that in the groundwater well sampling
14 program conducted on behalf of the State's lawyers,
15 you have found detections for bacteria in nine
16 wells?

04:21PM

17 MR. PAGE: Object to the form.

18 A This particular display, which presents a
19 subset of the total number of samples that would
20 have been collected and would have been produced to
21 you, including materials from 2005, 2006 and 2007,
22 represent itself has nine detections of fecal
23 coliform bacteria that are reported here. There's
24 additional data that you have in your possession in
25 non-graphical form.

04:22PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q All right. Have you created any graph to
2 depict additional water well samples that are not on
3 this Exhibit 6 to your deposition?

4 A I will. You have all the numerical data.

5 Q This well that's in the middle that you 04:22PM
6 identified as being the one that had a Salmonella
7 detection --

8 A Correct.

9 Q -- do you recall that? What's the fecal
10 coliform in that one? 04:22PM

11 A 2,400.

12 Q All right. Is that high?

13 A That's relatively high, yes.

14 Q All right. If you -- tell me, sir, to what
15 extent you or people on your behalf undertook to 04:22PM
16 identify the source of this high fecal coliform
17 reading and Salmonella in this water well?

18 A We simply determined there was a high fecal
19 coliform count, a high total coliform count and the
20 presence of Salmonella in that well. 04:23PM

21 Q You're not going to offer an opinion as to the
22 sources of those bacteria identified in that water
23 sample?

24 A I'm going to testify that bacterial
25 contamination is commonly found in water wells. 04:23PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q When Mr. George was asking you about septic
2 systems and the line of questioning was about their
3 potential to influence water well quality, you
4 indicated one of the steps that was taken in your
5 procedures was to locate where the septic system 04:23PM
6 was, if possible, at the locations where the water
7 well samples were taken; is that correct?

8 A That's my recollection, yes.

9 Q Okay. Beyond just identifying the location of
10 the well, was there any investigation undertaken to 04:24PM
11 determine the age of the system, the status of the
12 maintenance of the system, whether it was operating
13 properly?

14 A I don't know if that was done directly.

15 Q Did the SOP's require the field team to do 04:24PM
16 that?

17 A The field team did ask questions. I can't
18 recall what the SOP says in that regard. The field
19 team did ask questions of the landowner concerning
20 their knowledge of the property. 04:24PM

21 Q Dr. Fisher, I'm handing you a study I've
22 marked as Exhibit 13 to your deposition. I -- this
23 was Bates numbered with your numbers. I assume
24 you've at least read this.

25 A Yes, I reviewed this. 04:24PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Just for the Record, the title is Groundwater
2 Quality and Effects of Poultry Confined Animal
3 Feeding Operations on Shallow Groundwater, Upper
4 Shoal Creek Basin, Southwest Missouri 2000, by
5 Douglas N. M-U-G-E-L, Mugel, Muggle. Give me the
6 snapshot of what this study was for and what it
7 concluded.

04:25PM

8 MR. PAGE: Object to the form.

9 Q If you recall.

10 A Well, I have to take a look at the abstract to
11 tell you that because there are a lot of studies.

04:25PM

12 Okay. The study investigated or attempted to
13 investigate the impact of confined animal feeding
14 operations on groundwater quality in 47 wells and 8
15 springs. This is sampled in southwest Missouri in

04:26PM

16 one basin called the Shoal Creek Basin, and their
17 study area, according to their map, is within the
18 northeastern portion of the Springfield Plateau, a
19 portion of the Ozark area we discussed earlier

20 subject to the USGS report, and they had their wells
21 they're classifying as two types. They have P-type
22 wells, and those P-type wells are where there was a
23 good deal of poultry litter applied in their
24 vicinity, within a half mile radius of the well, so
25 close by the well, and so called AG wells, which

04:27PM

04:27PM

TULSA FREELANCE REPORTERS
918-587-2878

1 were open in this off of the Springfield Plateau
2 aquifer, but as he describes it, limited or no
3 association with poultry capons. When he examined
4 the data, he finds what appears to be an inverse
5 relationship, that is, that water quality in the
6 wells that are near poultry application sites are
7 not as contaminated as wells that are away from
8 poultry application sites. I think that's the
9 snapshot.

04:27PM

10 Q All right, thank you, and this study area is
11 on the Springfield Plateau; true?

04:28PM

12 A It is. It's within the Springfield Plateau,
13 and I've not really looked at the geology in detail
14 there, but it's in a different place. It's in the
15 northeastern portion.

04:28PM

16 Q It's in a different place but it is also part
17 of this Karsted terrain, including the spring --
18 including the Springfield Plateau aquifer?

19 A Yes.

20 Q Which is the situation as you described in the
21 Illinois River watershed?

04:28PM

22 A The study says what it says.

23 Q Okay. Are you familiar with the concept in
24 waste -- excuse me. Are you familiar with the
25 concept in nutrient management whereby a nutrient

04:29PM

TULSA FREELANCE REPORTERS
918-587-2878

1 planner endeavors to identify hotspots that could
2 present a higher risk of causing pollution if
3 nutrients are land applied?

4 A I'm familiar with the general concept of
5 identifying areas of higher concentration, which 04:29PM
6 might be a hotspot.

7 Q No. My question related to physical
8 characteristics upon the land that might lend itself
9 to creating a higher risk of pollution if, for
10 instance, poultry litter is applied there. 04:29PM

11 A Yes.

12 Q Okay. Which would include factors like the
13 slope or grade of the land?

14 A Correct.

15 Q The soil type or series? You can say agree or 04:29PM
16 disagree.

17 A Possibly. Generally it would be more soil
18 thickness than soil type or series.

19 Q Okay, soil depth. Under Oklahoma law what is
20 the minimum soil depth required before one can land 04:30PM
21 apply poultry litter?

22 MR. PAGE: Object to the form.

23 A Okay. I knew that when I walked in here.

24 Q Does 10 inches sound familiar?

25 A It may. Something along that line. I know 04:30PM

TULSA FREELANCE REPORTERS
918-587-2878

1 it's less than a foot.

2 Q All right. So you would agree a poultry
3 litter applicator has a legal obligation not to put
4 poultry litter down on soils less than 10 inches
5 deep; would you agree with that proposition? 04:30PM

6 A If there is a legal requirement not to do
7 that, then we would hope they would not do that.

8 Q Other hotspot issues, proximity to a water
9 body?

10 A Yes. 04:31PM

11 Q Do you know what Oklahoma law provides as far
12 as minimum setbacks from streams?

13 A My recollection, and you can refresh my
14 memory, is 50 feet.

15 Q All right, and there is a minimum setback from 04:31PM
16 a water wellhead as well?

17 A Correct. I don't recall what that is, but
18 it's of similar nature. Maybe it's a hundred feet,
19 a little further.

20 Q Is it your opinion, sir, that the physical 04:31PM
21 characteristics of a piece of land that would make
22 it a hotspot, that would create a higher risk of
23 pollution if an organic fertilizer was used, is
24 something that a trained person can identify?

25 A Right. If they're all laid out, they could. 04:31PM

TULSA FREELANCE REPORTERS
918-587-2878

1 I think another one that should be looked at and
2 probably is looked at, I think it probably is in
3 that set, being exposed bedrock, which would kind of
4 come under soil. If you knew about them, you could.

5 Q All right. Do you know, sir, whether the soil 04:32PM
6 scientists that prepare nutrient management plans
7 consider it part of their job to identify those
8 hotspots when they're preparing nutrient management
9 plans?

10 A Nutrient management plans that I have 04:32PM
11 examined, they do.

12 Q The standard operating procedures that were
13 employed by the sampling personnel, who drafted
14 them?

15 A Which ones; for groundwater? 04:32PM

16 Q Well, if there's a difference. Let's take the
17 primary -- I understand there's a multiple of media
18 here. Did you draft any of the standard operating
19 procedures?

20 A Yes. 04:32PM

21 Q Tell me which ones.

22 A I drafted one for the lake cores by a scuba
23 diver.

24 Q For the balance of them, who was the author or
25 authors? 04:32PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A They would have been authored corporately by
2 Camp, Dresser, McKee's personnel.

3 Q You indicated that the sampling personnel were
4 working under your direction or some words, similar
5 words; is that true? 04:33PM

6 A Yes, that is the truth. We discussed what
7 they were going to do.

8 Q Did you have co -- did you share that
9 authority with Camp, Dresser & McKee or --

10 A Yes. 04:33PM

11 Q All right. So not to be too colloquial but
12 who was the big kahuna; who called the shots?

13 A The on-site guy calling the shots?

14 Q No. Who was the absolute authority for how
15 the sampling was to be conducted? 04:33PM

16 MR. PAGE: Object to the form.

17 A That would have been a jointly decided opinion
18 on who was available between myself and Roger Olsen.

19 Q You both agreed on what would be in the SOP's?

20 A My recollection is, yes, we discussed them. 04:33PM

21 Q Did you review his?

22 A I had seen drafts of it.

23 Q Did you approve of the SOP's that Mr. Olsen
24 prepared?

25 A Yes. 04:34PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q How important is it for the field personnel to
2 follow those SOP's?

3 A Well, that's why they're written. You would
4 want them to follow them.

5 Q And what can be the consequences if they're 04:34PM
6 not followed?

7 A Well, you have -- the consequences could be
8 variable depending upon the variance from -- you
9 know, the impact of that variance on the SOP or in
10 the sample or analysis. 04:34PM

11 Q You mean you could have a variation that seems
12 rather technical and might be a paperwork violation
13 versus a violation that could result in, say, cross
14 contamination of a sample; that would maybe be two
15 ends of the spectrum; would that be a fair 04:34PM
16 statement?

17 A That's fair, yes, uh-huh.

18 Q The violation -- excuse me, the SOP's that are
19 directed towards protecting the integrity of the
20 physical sample, are those the most important of the 04:34PM
21 SOP's?

22 A Yes.

23 Q To your knowledge, sir, were SOP's followed by
24 the field personnel taking samples for the attorney
25 general's group? 04:35PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A To my knowledge, yes.

2 Q What effort was done to verify that they were
3 following the SOP's?

4 A There was direct supervision of the field
5 sampling teams, principally by Camp, Dresser & McKee 04:35PM
6 personnel.

7 Q So it would have been in the field; there
8 would have been somebody there with them that would
9 have been the quality assurance officer or something
10 like that? 04:35PM

11 A Or available to them.

12 Q Okay. Did anyone go back and review any of
13 the video or photographs to determine whether there
14 were any violations of standard operating procedures
15 in the field? 04:35PM

16 A I don't know.

17 Q It's not something you did?

18 A No.

19 Q Who trained the personnel; who took the
20 samples? 04:35PM

21 A For groundwater sampling?

22 Q Litter, soil and water sampling?

23 A Okay. The training for litter, soil and water
24 sampling was sort of multi-tiered. There was
25 biosecurity training that was conducted by 04:36PM

TULSA FREELANCE REPORTERS
918-587-2878

1 veterinarians from the State of Oklahoma for all
2 personnel, and then with respect to litter and soil
3 sampling, there was specific protocols worked out
4 for that and then practiced. For groundwater
5 sampling, those protocols were followed, and
6 experienced people went along to assist in sampling.

04:36PM

7 Q I personally observed some of the sampling,
8 and I saw some young adults, looked like college
9 kids to me, just my term. Who were those people out
10 there sampling?

04:36PM

11 A Some of those individuals were my employees.
12 They were students.

13 Q Students of the university?

14 A Yes.

15 Q All right. Let's change tapes. If you don't
16 mind staying put, I'm trying to be done here in just
17 a couple of minutes.

04:37PM

18 VIDEOGRAPHER: We're off the Record. The
19 time is 4:37 p.m.

20 (Following a short recess at 4:37 p.m.,
21 proceedings continued on the Record at 4:41 p.m.)

04:39PM

22 VIDEOGRAPHER: We are back on the Record.
23 The time is 4:41 p.m.

24 Q Dr. Fisher, in your analysis, have you
25 attempted to account for the die-off of bacteria as

04:41PM

TULSA FREELANCE REPORTERS
918-587-2878

1 a limitation on the distance bacteria can travel
2 through the soils or subsurface?

3 A With respect to my analysis?

4 Q Yes, sir.

5 A No.

04:42PM

6 Q When the streams in the Illinois River are at
7 low or let's call it base flow, is that -- we both
8 understand what base flow means?

9 A I believe so.

10 Q All right. You tell me your definition of
11 base flow.

04:42PM

12 A A base flow is which flow is being supported
13 by groundwater.

14 Q All right. So the water quality during base
15 flow would reflect influences from groundwater in
16 the basin?

04:42PM

17 A Yes.

18 Q It would also reflect influences from point
19 sources; right?

20 A Yes.

04:42PM

21 Q In fact, when the rivers are low, a
22 considerable amount of the flow in the streams is
23 from the point sources upstream?

24 MR. PAGE: Object to the form.

25 A That would depend on what stream you're

04:42PM

TULSA FREELANCE REPORTERS
918-587-2878

1 looking at.

2 Q All right. Fair question. Let's just talk
3 about the Illinois River in Oklahoma. Base flow,
4 the water volume is, to a significant degree,
5 contributed by the point sources upstream?

04:43PM

6 MR. PAGE: Object to the form.

7 A I think there are certainly point source
8 contributions. I don't know what significant would
9 be.

10 Q All right. It's not something you've
11 quantified in your work?

04:43PM

12 A No.

13 Q The -- we haven't talked much today about the
14 streams themselves, and is the water quality within
15 the streams, is that something within the scope of
16 your work in this case?

04:43PM

17 A I think it is. I think that my -- let me look
18 at the affidavit. I think that's true. I don't
19 mean to be coy with you. I just want to be sure I
20 recall this specifically. We talk about surface
21 water movement, and we talk about the -- yeah, the
22 movement of waste into surface and groundwater. So
23 movement, transport of materials into surface water
24 would be part of my opinion, yes.

04:43PM

25 Q But characterizing stream water quality itself

04:44PM

TULSA FREELANCE REPORTERS
918-587-2878

1 is not part of your assignment here, is it?

2 MR. PAGE: I'll object to the form.

3 MR. McDANIEL: Well, I'm trying to

4 understand who is the stream water expert on the

5 team. That's all I'm trying to figure out, whether 04:44PM

6 it's Dr. Fisher or someone else.

7 MR. PAGE: He's probably more of the one on

8 attributes of streams.

9 MR. McDANIEL: I understand.

10 MR. PAGE: I don't understand your question 04:44PM

11 either, Scott. To me it's a little ambiguous.

12 MR. McDANIEL: I understand. It probably

13 is.

14 Q What you just recited, Dr. Fisher, as it

15 relates to the work for the preliminary injunction, 04:44PM

16 have you described the extent to which your opinion

17 touches on stream water quality?

18 A If I described it in testimony today, I

19 believe so. I would say that there are bacteria in

20 streams. It varies with flow. 04:45PM

21 Q All right. Water, the water quality -- excuse

22 me. Let me rephrase this. If the groundwater is

23 contaminated with bacteria and it then -- then it

24 should reflect to some degree in the base flow water

25 quality of the streams? 04:45PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I would believe so, yes.

2 Q I, as counsel for Peterson Farms, sent some
3 interrogatories to the State, and I got responses
4 yesterday or last night, and you're referenced in
5 them, so let me ask you a couple of questions. One 04:46PM

6 of the questions I asked, and let me ask you to
7 listen closely to the question, and it's my

8 Interrogatory No. 1 from my December 21st, 2000
9 (sic) set. For each location where you contend

10 fecal bacteria contamination from poultry waste from 04:46PM

11 any poultry growing operation under contract with
12 Peterson Farms was identified, your answer should
13 include, but not necessarily be limited to,

14 identifying the specific source location, identify
15 the date and location where you contend that fecal 04:46PM

16 bacteria contamination was detected, identify the
17 species and concentration of the fecal bacteria,
18 identify the dates the poultry waste was applied to
19 the source location, and fully describe the basis

20 for your contention that the fecal bacteria 04:46PM

21 contamination derived from poultry waste at the
22 source location. Let me let you look at it. It was
23 long. And the question in non-lawyer terms is, if
24 you contend that any of the bacteria you detected
25 came from a land application site where poultry 04:47PM

TULSA FREELANCE REPORTERS
918-587-2878

1 litter originating in a Peterson contract farm were
2 applied, tell me what the basis for that contention
3 is. You're referenced as one of the elements of the
4 State's evidence in response to that interrogatory.
5 So, Dr. Fisher, tell me, sir, to what extent can you 04:47PM
6 testify that you have identified any bacterial
7 contamination at any location within the Illinois
8 River watershed that has originated from the litter
9 from a Peterson contract farm in the Illinois River
10 watershed? 04:48PM

11 MR. PAGE: Object to the form.

12 A We have a circumstance where there is a
13 coalescence of events, and it's outlined in here.

14 Q Let me have the answer back because I want
15 your answer, not just the State's. 04:48PM

16 A Well, I'm giving you the answer.

17 Q Okay. Go ahead.

18 MR. McDANIEL: I just don't want him to
19 read what the lawyers said.

20 A There is a specific Peterson contract grower, 04:48PM
21 Waymon Rhoads, which is the specific one. Waste
22 from Waymon Rhoads was observed being loaded there
23 and carried to a field at a specific location. That
24 waste was applied at that field. At some time
25 somewhat removed, not long after, maybe -- I've 04:48PM

TULSA FREELANCE REPORTERS
918-587-2878

1 forgotten the dates, but fairly shortly after,
2 within maybe one or two weeks, a rainfall event
3 occurred which resulted in runoff from that field,
4 which was sampled by an edge of field sample, and
5 that edge of field sample was found to contain high
6 levels of bacteria.

04:48PM

7 Q What kind of bacteria?

8 A I'd have to look at the analytical data.

9 Q Is that it?

10 A That's it.

04:49PM

11 Q Okay. Sir, is it --

12 MR. PAGE: Let me object to the form of the
13 last question. It was ambiguous to me.

14 MR. McDANIEL: The is that it question?

15 MR. PAGE: Yeah.

04:49PM

16 Q Is there anything else to your answer?

17 MR. PAGE: With regard to the interrogatory
18 question?

19 MR. McDANIEL: Yeah. I'll strike it, I'll
20 strike it.

04:49PM

21 Q You answered the question and we'll go to the
22 next question, all right? I'm not trying to waste
23 time or create confusion. Are you aware of any
24 regulatory standard, Dr. Fisher, that specifies what
25 the bacterial limits must or cannot -- excuse me.

04:49PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Let me rephrase this. Are you aware of any state or
2 federal regulation that limits bacterial counts in
3 edge of field runoff from agricultural fields?

4 A Yes.

5 Q What is it? 04:50PM

6 A You're prohibited from discharge.

7 Q You can't have any bacteria come off an
8 agricultural area?

9 A You can't have pollution come off the
10 agricultural field. 04:50PM

11 Q That wasn't my question. You have to have a
12 zero bacterial count for agricultural or runoff from
13 an agricultural field, Dr. Fisher; is that your
14 testimony?

15 A My testimony is that I'm unaware of any 04:50PM
16 numeric limit on bacteria in runoff from an
17 agricultural field. Nonetheless, the extension is
18 in that -- and my understanding of regulations
19 within Oklahoma is that -- and that's not within
20 Oklahoma. That was within Arkansas. That within 04:50PM
21 Oklahoma you may not discharge pollutants.

22 Q What harm resulted from that edge of field
23 runoff, Dr. Fisher?

24 MR. PAGE: Object to the form.

25 A Bacteria entered surface waters. 04:50PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q What surface water?

2 A A drainageway that would lead to a bit larger
3 drainageways.

4 Q Well, where did -- did you in fact trace that
5 edge of field runoff into a recognized stream? 04:51PM

6 A That particular parcel of edge of field
7 runoff?

8 Q Yes, sir.

9 A No.

10 Q You would agree that just because water runs 04:51PM
11 off one field doesn't mean it makes it all the way
12 to a stream or tributary in the Illinois River
13 watershed; right?

14 A Well, I don't know how else water gets into
15 the Illinois River watershed or streams or 04:51PM
16 tributaries except by two mechanisms, runoff from
17 fields and other land surfaces and groundwater
18 supply.

19 Q How far was that field away from a recognized
20 tributary or stream? 04:51PM

21 MR. PAGE: Object to the form.

22 A I'd have to look at the map to answer that
23 question.

24 Q Let me ask a more basic question because
25 apparently my prior question wasn't very good. 04:51PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Isn't it possible, Dr. Fisher, that water can run
2 off of one field and end up slowing down and going
3 into the soil in the next field over?

4 A True, and it's possible it can then infiltrate
5 into groundwater.

04:52PM

6 Q It's possible. I'm not arguing that point.
7 I'm just saying just because it ran off the field,
8 doesn't mean it ran all the way to the Illinois
9 River. That was the point I was trying to get you
10 to agree to.

04:52PM

11 A Well, ultimately, unless the water is
12 evapo-transpired, it's going to get to the Illinois
13 River.

14 Q What if it's taken up by plants or it does
15 evaporate or it goes into a pond and the cattle
16 consume it?

04:52PM

17 A Well, the first two things, goes into plants
18 or is evaporated is called evapo-transpiration,
19 which I referred to.

20 Q All right.

21 A And there are mechanisms for water loss other
22 than runoff into the Illinois River and its
23 tributaries. Nonetheless, there are no other
24 mechanisms for water to reach the Illinois River and
25 its tributaries other than through runoff and the

04:52PM

TULSA FREELANCE REPORTERS
918-587-2878

1 movement of ground water.

2 Q All right. Let's not debate that point.

3 The -- has the State to your knowledge done anything
4 to trace the bacteria in that edge of field runoff
5 to any waters of the state? 04:53PM

6 A I don't know.

7 Q And based upon your answer, that's the only
8 circumstance you can cite that is responsive to the
9 interrogatory I questioned you --

10 MR. PAGE: Object to the form. 04:53PM

11 A That's the only one I was aware of when that
12 question was posed to me.

13 Q Let me follow up on Mr. George's question.
14 Have you ever observed Peterson Farms, Incorporated
15 spreading poultry litter in the Illinois River 04:53PM
16 watershed?

17 A Personally? Any observation?

18 Q Have you observed it or received a report that
19 it has occurred?

20 A I have observed or we have had reports of 04:54PM
21 observations of waste from Peterson Farms growers
22 being spread in the Illinois River watershed. Those
23 reports include at least the report we just cited,
24 which is from an investigator, and in addition to
25 that, the Oklahoma Department of Agriculture, Food & 04:54PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Forestry records, that clearly indicate growers that
2 were Peterson growers have had waste disposed within
3 the Illinois River watershed.

4 Q All right. For purposes of the answer you
5 just gave, you're assuming that -- you are calling a 04:54PM
6 grower under contract with Peterson farm, you are
7 calling that a Peterson operation in your use of the
8 terms; correct?

9 A That's correct.

10 Q All right. Now, I need you to assume with me 04:54PM
11 there's a difference between a contract grower's
12 farm and a Peterson company-managed farm, if you can
13 assume there's a difference. Do you know there are
14 such different types of arrangements in the
15 watershed? 04:55PM

16 A I'm unfamiliar with those business
17 arrangements in detail. So you could enlighten me
18 as to them.

19 Q Okay. So let's clarify your prior answer.
20 You have seen or heard reports of poultry litter 04:55PM
21 being applied that originated at a poultry farm
22 under contract with Peterson Farms?

23 MR. PAGE: Object to the form.

24 A I am aware of poultry litter having been
25 disposed within the Illinois River watershed, whose 04:55PM

TULSA FREELANCE REPORTERS
918-587-2878

1 origin was a farm that was associated with Petersons
2 in a record or in an observation, record of an
3 observation.

4 Q Was it your job, sir, to determine how many
5 active poultry houses there are in the Illinois 04:55PM
6 River watershed?

7 A Yes.

8 Q And I read your methodology for how you
9 identified the active houses. Am I to -- was every
10 poultry house in that watershed viewed on the ground 04:56PM
11 to confirm whether it's active or not?

12 A Every poultry house within the watershed that
13 was identified in the spring of 2005 aerial
14 photograph that could be viewed from a ground
15 location on public access was viewed. 04:56PM

16 Q What's the potential error rate in your
17 determination of the number of poultry houses in the
18 watershed?

19 A Okay. That was not the single criteria for an
20 active house. 04:56PM

21 Q Okay. I asked the question -- this is a
22 different question. What is the error rate in your
23 estimation of the number of poultry houses, active
24 poultry houses in the Illinois River watershed?

25 MR. PAGE: Object to the form. 04:57PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A That information is under continual review. I
2 think the error rate is probably better than 10
3 percent, less than 10 percent.

4 Q Based on what?

5 A Based upon the fact that we have corroborating 04:57PM
6 information from files produced by the defendants
7 represented in this room, as well as from the tax
8 assessor records, in which those taxes are assessed
9 of the integrator but they are divvied up by school
10 district and assigned specifically to individual 04:57PM
11 names.

12 Q You've actually compared your house count with
13 the information that the defendants have produced in
14 this case?

15 A Well, that's kind of a long question because 04:57PM
16 I've compared the house counts to information
17 produced by the defendants in this case as of
18 probably awhile back, maybe several months ago. I
19 understand there has been additional production. In
20 fact, there were additional production of bird 04:58PM
21 counts by -- within the watershed by the defendants
22 within the last week or so.

23 Q Which would be a more reliable number, sir,
24 what my client maintains on its books as the number
25 of active poultry houses or what your methodology 04:58PM

TULSA FREELANCE REPORTERS
918-587-2878

1 count is for my client, contract poultry farms?

2 A Well, had the records from the defendants been
3 of similar quality, they could have been used to
4 generate a consistent house count at a given time
5 frame. 04:58PM

6 Q Sounds like you're excusing the weakness of
7 your analysis.

8 A No. My analysis I think is quite robust.

9 Q I gathered that you came up with a number of
10 average tons of litter per house in order to apply 04:58PM
11 to the number of houses in the analysis; is that
12 true?

13 A That's correct.

14 Q And you arrived at that tons per house figure
15 based on information from the Eucha-Spavinaw 04:59PM
16 watershed management team?

17 A That is correct.

18 Q To what extent did you account for the change
19 in poultry house cleanout practices driven by the
20 settlement in the City of Tulsa case? 04:59PM

21 A Poultry house cleanout, you mean with respect
22 to transportation or with respect to sampling of the
23 waste?

24 Q No. With respect to cleanout.

25 A Okay. I don't know that there are any 04:59PM

TULSA FREELANCE REPORTERS
918-587-2878

1 particular change in practices with respect to
2 cleanout as a consequence of the City of Tulsa case.

3 Q You weren't aware that there were some growers
4 in the Eucha-Spavinaw watershed that went multiple
5 years without cleaning out as a consequence of that 04:59PM
6 action, which would be reflected in the tonnages
7 when their houses eventually were cleaned out?

8 A No, no, no, no, no. I am quite aware of that.

9 As I read the animal waste management plans, those
10 animal waste management plans talked about 05:00PM

11 production of waste in those houses and for nearly
12 all of the houses, gave dimensions of those houses.

13 So they're talking -- those animal waste management
14 plans make no discussion of what we're going to do

15 with the preexisting waste. They're not talking 05:00PM

16 about actual waste disposal, what actually came out,

17 we're talking -- or what measurements were because

18 that would have potentially some issue. We're

19 talking about the animal waste management plans that

20 were written, and within the description of 05:00PM

21 operation, they would describe the type of

22 operation, the number of houses, the size of those

23 houses and the number of tons of litter and/or cake

24 that would be generated by those houses and cleaned

25 out on an annual basis. That's the basis for that 05:00PM

TULSA FREELANCE REPORTERS
918-587-2878

1 information.

2 Q What -- for a typical broiler house, what's
3 the tons per year that you used in your calculation?

4 A Well, the tons per year, there is no typical
5 broiler house. The broiler houses, as they were 05:01PM
6 assessed, were assessed by their area because there
7 is a specific and average number of tons per year of
8 waste generated by a broiler house per square foot
9 of house.

10 Q What was the range that you used for broiler 05:01PM
11 houses in your calculation?

12 A I'd have to review the document. It's not a
13 gigantic range.

14 Q More than 175 tons a year?

15 A Some instances, yes. 05:01PM

16 Q Did you -- why didn't you look at the waste
17 management plans generated for the Illinois River
18 watershed to see what the expected tonnage per house
19 was?

20 A Well, in the state of Arkansas animal waste 05:01PM
21 management plans are very difficult to come by.

22 Q What does the Oklahoma Department of
23 Agriculture, Food & Forestry use as its rule of
24 thumb for poultry litter production for a broiler
25 house? 05:02PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I think they're using 125 tons, and I think
2 they're out of date.

3 Q What are the nutrient plan writers in Oklahoma
4 using as an expected production of litter?

5 A I'd have to review that. It would probably be 05:02PM
6 a similar number. The Eucha-Spavinaw data was the
7 single set of information that was gathered in a
8 uniform way under court supervision, in which we had
9 a very limited number of individuals who wrote
10 nutrient management plans and they were put together 05:02PM
11 in a consistent format. This is a watershed that is
12 contiguous to touching the Illinois River watershed.

13 If you can't tell sometimes when you drive across
14 the watershed boundary, if you take a look at the
15 operations there, they look like a microcosm of the 05:03PM
16 Illinois River watershed. So it's an excellent
17 model for what happens in the Illinois River
18 watershed.

19 Q How did you validate that that model is
20 correctly applied to the Illinois River watershed? 05:03PM

21 A Take a look at experts in the industry who
22 have been deposed in this case, Tommy Daniels, for
23 example. If you talk about how poultry operations
24 are run, they're run uniformly. We have very
25 similar practices one place to another. So there's 05:03PM

TULSA FREELANCE REPORTERS
918-587-2878

1 no reason to believe that broiler operations, which
2 are the largest source of waste within the Illinois
3 River watershed, are run differently from any other
4 broiler operations in this area.

5 Q All right. You're not aware of any reason 05:03PM
6 they would be doing it?

7 A No.

8 Q With regard to bacteria, how does the water
9 quality, surface water quality in the Illinois River
10 watershed, currently how does it differ from prior 05:04PM
11 years?

12 MR. PAGE: Object to the form.

13 A Currently how does it differ from prior years?
14 I'm not sure I'm --

15 Q How does the current -- with regard to 05:04PM
16 bacteria, how does the current water quality and
17 surface waters of the Illinois River compare to
18 prior years; in other words, is it worse, is it
19 better, same or do you know?

20 MR. PAGE: Object to the form. 05:04PM

21 A I've not made a really careful analysis of all
22 of that. My impression is that it's somewhat worse
23 now than it was in the past.

24 Q I don't want impressions. I want scientific
25 opinions. Do you have information upon which you 05:04PM

TULSA FREELANCE REPORTERS
918-587-2878

1 can state a scientific opinion, Dr. Fisher?

2 A I think that opinion will be stated by other
3 experts in this case.

4 Q All right. With regard to bacteria, with
5 regard to bacterial water quality in groundwater in 05:05PM
6 the Illinois River watershed, is it currently
7 better, worse or the same from prior years?

8 MR. PAGE: Object to the form.

9 Q Or do you know?

10 A With -- comparing the current suite of samples 05:05PM
11 to prior samples, which are in Arkansas, it appears
12 that it was -- there was contamination in the past
13 and there's contamination today. I cannot give you
14 a time series comparison of groundwater
15 contamination. 05:05PM

16 Q There's insufficient samples from which one
17 could statistically determine a trend; is that a
18 correct statement?

19 A I don't know if that's a correct statement.
20 It's my impression that there were a relatively 05:05PM
21 small number of samples, and they're not taken in
22 any sort of regularized way.

23 Q But --

24 A I'm sorry, one more amendment to that, Mr.
25 McDaniel. They're also not done in a synoptic 05:06PM

TULSA FREELANCE REPORTERS
918-587-2878

1 sense. We attempted to do a synoptic sampling of
2 the watershed.

3 Q With regard to whether there are any trends in
4 water quality with regard to bacteria in the
5 Illinois River watershed for purposes of the 05:06PM
6 preliminary injunction, you're not prepared to offer
7 an opinion?

8 A I will not be offering an opinion on that.

9 Q With regard to the water wells where your
10 group identified the tests for bacteria, did your 05:06PM
11 group go back and warn any of those well owners that
12 they should take precautions with regard to those
13 wells?

14 A Those -- that information was delivered to the
15 well owners or the people who occupied the house, 05:06PM
16 whether they be the owners or occupants.

17 Q What do you mean; what information?

18 A The information as to the analysis that was
19 present. That's my knowledge of that.

20 Q Okay. I understand you're telling me they 05:07PM
21 were given the analytical results, but to your
22 knowledge were any of them given a warning about the
23 consumption of the water from their well?

24 A I'm not exactly sure what they were told.

25 Q Okay. 05:07PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I don't know.

2 Q You don't know, thank you. You made a
3 statement when Mr. George asked you a question, and
4 you said that you believe that poultry litter was a
5 highly significant source of bacteria in the waters 05:07PM
6 in the Illinois River watershed. Did I restate
7 that -- did I state your position correctly?

8 A I think that's accurate.

9 Q You also indicated that you have not
10 undertaken to quantify the contributions of other 05:07PM
11 sources to the bacterial load in the Illinois River
12 watershed; is that a correct statement?

13 A That's correct.

14 Q How can you offer the conclusion, Dr. Fisher,
15 that poultry litter is highly significant if you 05:08PM
16 have not quantified other sources?

17 A It's an extremely large mass of fecal
18 bacterially contaminated material that is
19 distributed into the broadcast, into the
20 environment. 05:08PM

21 Q Well, how do you know that, for instance, all
22 the types of cattle in the watershed isn't an order
23 of magnitude bigger than poultry if you haven't
24 calculated that?

25 A Cattle distribute their waste in time and in 05:08PM

TULSA FREELANCE REPORTERS
918-587-2878

1 space. They poop in the pasture, so to speak, and
2 they do that over the full year as we discussed
3 earlier. The poultry waste is accrued for a long
4 period of time and then is distributed in
5 concentrated areas in a very short period of time.

05:08PM

6 Q All right. Your statement that poultry litter
7 is a highly significant source is a qualitative
8 statement, not a quantitative statement; is that
9 fair?

10 A I don't know if it's fair or not. It may well
11 be a qualitative statement.

05:09PM

12 Q Well, you haven't numerically determined that;
13 you're offering your opinion without having
14 numerically compared the poultry litter contribution
15 of bacteria to the waters with any other source?

05:09PM

16 MR. PAGE: Object to the form.

17 A And I believe other experts will offer
18 quantitative opinion.

19 Q One last question. I know the other lawyers
20 are dying for me to quit and I appreciate their
21 patience. Since 1996, in your work life since 1996,
22 identify the years in which your workplace was not
23 at or in a law firm.

05:09PM

24 A At or in a law firm? It would be the period
25 from 1996 --

05:10PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Let me --

2 A Four years.

3 Q Okay.

4 A Four years, exclusive of working at the

5 University of Tulsa.

05:10PM

6 Q From 1996 until, what, 2001 or 2000 you worked
7 at the law firm of Gardere & Wynne?

8 A That's correct.

9 Q And you worked as a scientist in support of

10 litigation attorneys; correct?

05:10PM

11 A That's correct.

12 Q Mr. Page, sitting to your right, was one of
13 your supervisors; correct?

14 A That's correct.

15 Q When you left Gardere & Wynne, you went to
16 work with Exponent and you had your own office; is
17 that correct?

05:10PM

18 A That's correct.

19 Q When did you leave that office?

20 A Left that office in August of 2004.

05:10PM

21 Q When you formed Lithochimeia, where did you
22 put your office; where was your office?

23 A 222 South Kenosha Avenue.

24 Q And who owns that building?

25 A Randy Miller.

05:10PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q And Randy Miller of the Miller, Keffer,
2 Bullock law firm?

3 A At that time, yes.

4 Q All right. Mr. Randy Miller was also your
5 boss at Gardere & Wynne?

05:11PM

6 A One of them.

7 Q Okay. How long were you at that location?

8 A I was there from August of 2004 until I
9 believe June of 2007.

10 Q In June of 2007 where did you move your
11 Lithochimeia office?

05:11PM

12 A To 110 West 7th Street, Suite 105.

13 Q All right, and whose office is that?

14 A Well, my name is on the door along with at the
15 time the Bell Legal Group and CDM.

05:11PM

16 Q Okay. Did you share a suite with the Bell
17 Legal Firm and Camp, Dresser & McKee?

18 A Yes.

19 Q All right, and where is your office today;
20 still at that location?

05:11PM

21 A Yes, it is.

22 Q All right.

23 MR. McDANIEL: That's all the questions I
24 have.

25 MR. ELROD: How much time we got?

TULSA FREELANCE REPORTERS
918-587-2878

1 COURT REPORTER: You've got 51 minutes.

2 MR. ELROD: Want to split it?

3 MR. SANDERS: I want about five minutes,
4 John.

5 MR. ELROD: You want five? How much time
6 do you need, John?

7 MR. TUCKER: I can talk fast if he can
8 listen fast. Don't count this against us.

9 MR. BULLOCK: Time's running.

10 MR. TUCKER: Turn the tape off. 05:12PM

11 MR. BULLOCK: No, we're not turning the
12 tape off. We'll just keep deposing.

13 MR. TUCKER: Turn the tape off.

14 VIDEOGRAPHER: We're off the Record. The
15 time is 5:12 p.m. 05:12PM

16 (Following a short recess at 5:12 p.m.,
17 proceedings continued on the Record at 5:14 p.m.)

18 VIDEOGRAPHER: We are back on the record.
19 The time is 5:14 p.m.

20 DIRECT EXAMINATION

21 BY MR. ELROD:

22 Q Mr. Fisher, my name is John Elrod. I
23 represent Simmons Foods. Will you agree with me
24 that a highway cut permits you to see what is
25 actually under the ground in Karst terrain? 05:14PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A A highway cut provides a vision of that
2 section of geology that it exposes. It is not
3 necessarily reflective of the geology in general of
4 an area.

5 Q Have you ever taken time to look at the 05:15PM
6 highway cuts on Highway 412 from Kansas, Oklahoma to
7 Tontitown, Arkansas?

8 A I have.

9 Q You see no fissures, you see no caverns; isn't
10 that true? 05:15PM

11 A I don't believe that is true.

12 Q All right.

13 A And I also don't believe that the plethora of
14 scientific data that exists for that reason would
15 agree with that either. 05:15PM

16 Q Have you read -- do you know who Dr. Van
17 Brahana at the University of Arkansas is?

18 A Yes, I do.

19 Q Have you read Dr. Brahana's report produced
20 for the plaintiffs or at the request of the 05:15PM
21 plaintiffs in what we call the Prairie Grove cases
22 related to arsenic?

23 A I have not.

24 Q Are you aware that Dr. Van Brahana at the
25 request of the plaintiffs conducted such a study and 05:15PM

TULSA FREELANCE REPORTERS
918-587-2878

1 found absolutely no arsenic contamination in the
2 water wells surrounding Prairie Grove, Arkansas?

3 A I am not.

4 Q Do you think that would be of interest to you
5 to read that study? 05:16PM

6 A It might be. I have no idea exactly what the
7 study covers.

8 Q If I send it to you, will you read it?

9 MR. McDANIEL: And then appear for another
10 deposition. 05:16PM

11 MR. PAGE: Is that one of the reports that
12 is under court seal?

13 MR. McDANIEL: No.

14 MR. ELROD: No.

15 MR. PAGE: No confidentiality order? 05:16PM

16 MR. ELROD: No, no. I'm not aware of any
17 confidentiality orders in Prairie Grove.

18 MR. GEORGE: In fact, he published that
19 study.

20 MR. ELROD: Yeah, he published it. 05:16PM

21 MR. GEORGE: Much to the chagrin of
22 plaintiff's lawyers.

23 MR. ELROD: You're taking up my time.

24 MR. GEORGE: Sorry.

25 Q Do you agree with Dr. Engel that there are 05:16PM

TULSA FREELANCE REPORTERS
918-587-2878

1 482,000 acres of pastureland in the IRW?

2 A If that in fact is what he said in his
3 deposition, then I do.

4 Q Is it the position of the attorney general in
5 this case that the plaintiffs will ignore the 05:17PM
6 existence of wildlife and wildlife's impact on
7 bacteria in the IRW?

8 MR. PAGE: Object to the form.

9 A I'm not sure what the attorney general's
10 position is with respect to wildlife. 05:17PM

11 Q What do you know about whether anybody has
12 taken a look at wildlife numbers in the IRW in this
13 case; has that happened?

14 A I don't know.

15 Q Have you heard one way or the other? 05:17PM

16 A I don't know.

17 Q Okay. Because it's not been a point of
18 discussion in your presence?

19 A No.

20 Q Do you know what the septic failure rates are 05:17PM
21 in the IRW?

22 A I do not.

23 Q Do you know what a septic failure is?

24 A Well, I know what a septic failure is from my
25 boyhood, having lived growing up with a septic tank. 05:17PM

TULSA FREELANCE REPORTERS
918-587-2878

1 It would be mainly failure of a leach field, in
2 which the leach field short circuits and has direct
3 communication with the surface, leaving and sending
4 non-treated materials into the environment.

5 Q It's what you flush down the toilet and send 05:18PM
6 down your lavatory and your SinkErator, InSinkErator
7 is going right into the ground, underground area,
8 isn't it?

9 A Well, it's bypassing the treatment system.

10 Q Right. Not being treated at all? 05:18PM

11 A I wouldn't say it's not being treated at all
12 because it's not being treated by the treatment
13 system at all.

14 Q My understanding is that you started working
15 in this case at around 2004; is that true? 05:18PM

16 A That's true.

17 Q And so you've been working in the case for
18 approximately four years?

19 A I've been working on this case from August,
20 maybe August, September really of 2004 to the 05:18PM
21 present, which is January of 2008.

22 Q And have you concentrated on groundwater
23 sampling protocols?

24 A I've had numerous technical roles in this case
25 in advising the attorneys on a number of things. 05:19PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Have you been involved in groundwater sampling
2 protocols?

3 A I have had involvement, as I testified to Mr.
4 McDaniel, in groundwater protocols.

5 Q And are you aware of the 1,771 wells in the 05:19PM
6 IRW -- is that just on the Oklahoma side?

7 A Yes, sir.

8 Q Are you aware of how many of those have
9 bacteria treatment attached to them, like
10 chlorinators? 05:19PM

11 A I think there are very few from any
12 observations.

13 Q The vast majority of those people are drinking
14 water right out of ground, aren't they?

15 A If they're using a groundwater well, yes. 05:19PM

16 Q Untreated?

17 A Yes.

18 Q And you've been on this case for four years?

19 A Yes.

20 Q How many sick people have you identified that 05:19PM
21 got sick from drinking well water?

22 MR. PAGE: Object to the form.

23 A I have no expertise in identifying sick
24 people.

25 Q Has anyone on the attorney general's team 05:20PM

TULSA FREELANCE REPORTERS
918-587-2878

1 identified one sick person who got sick from
2 drinking well water in the IRW?

3 MR. PAGE: Object to the form.

4 A I don't know.

5 Q Why isn't that something that would be of 05:20PM
6 interest to you?

7 MR. PAGE: Object to the form.

8 A I think that exposure to bacteria in the IRW
9 and resulting illness will be addressed by other
10 experts in this area. 05:20PM

11 Q Is it your testimony that you are aware that
12 there are experts who will testify in this case who
13 have identified a sick person who got sick from
14 drinking well water?

15 MR. PAGE: Object to the form. 05:20PM

16 A I don't know what they will testify to with
17 respect to the source of the ingestion or exposure,
18 but I do know that there will be individuals
19 testifying about exposures to bacteria and resulting
20 illness. 05:20PM

21 Q And who are those people?

22 A Be Dr. Christopher Teaf.

23 Q Anybody else?

24 A Not to my knowledge.

25 Q And you've worked with Dr. Teaf in this 05:20PM

TULSA FREELANCE REPORTERS
918-587-2878

1 matter, have you not?

2 A Yes, I have.

3 Q Did your curiosity not cause you to ask him a
4 question of whether or not anybody has gotten sick
5 from drinking, actually drinking the water from the
6 1,771 wells?

05:21PM

7 MR. PAGE: Object to the form.

8 A I've never asked him that question.

9 Q You've never asked him that?

10 A No, sir.

05:21PM

11 Q Why would not that be of some degree of
12 curiosity to you in this matter?

13 MR. PAGE: Object to the form.

14 A Because I'm not charged with detecting ill
15 people.

05:21PM

16 Q Of the 48 people who permitted you to sample
17 in 2006, how many of those people got sick from
18 drinking their well water?

19 A I don't know.

20 Q Why wasn't that question on your -- in your
21 protocol to ask those people?

05:21PM

22 MR. PAGE: Object to the form.

23 A It's not a health-based protocol. It's a
24 protocol which is for sampling the wells.

25 Q But again --

05:21PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A And for establishing --

2 Q -- wouldn't you be curious as to whether
3 somebody actually in the real world got sick from
4 drinking their well water?

5 MR. PAGE: Object to the form. 05:22PM

6 A I would have inadequate expertise to make that
7 evaluation.

8 Q I want to direct your attention to -- I think
9 this is No. 7, isn't it?

10 MR. PAGES: I think that's No. 6, Mr. 05:22PM

11 Elrod.

12 MR. GEORGE: No. 6.

13 Q Have you got it in front of you, Dr. Fisher?

14 A I will in a second I believe. Yes.

15 Q Who selected these sites? 05:22PM

16 A Okay. The selection of these sites was
17 conducted by myself and Darren Brown from CDM. It
18 was a fairly -- and we targeted the sites that we
19 would elect to sample on the basis of -- well, a
20 number of bases. We wanted to get a distribution, a 05:23PM

21 spatial distribution within the Illinois River
22 watershed. We wanted them to be at varying
23 distances from specific types of geographic
24 features. We wanted those wells to be shallow
25 groundwater wells that is producing from depths of 05:23PM

TULSA FREELANCE REPORTERS
918-587-2878

1 150 feet or less. Let's see. What other criteria,
2 and, oh, with respect to -- well, we also needed to
3 get permission to access those wells. So within
4 those constraints, we had a large number of wells to
5 go to for specific areas, and then we would sample
6 the ones for which we obtained permission.

05:23PM

7 Q Do you see the cluster of eight wells that is
8 sort of in the middle of the sheet, lower left-hand
9 quadrant slightly that is north of Caney Creek and
10 south of Barren Fork?

05:24PM

11 A Yes.

12 Q The one on the left would be Osborn?

13 A Yes.

14 Q Okay. What -- I've seen that cluster before
15 on some of your maps. Can you explain to me why
16 that cluster of wells were selected?

05:24PM

17 MR. PAGE: Object to the form.

18 A Well, I'll have to review my records. I think
19 that that may be -- one of the other goals was to
20 have both type and broad sampling grids. This is a
21 tight sampling grid, in addition to the more broadly
22 synoptic study.

05:24PM

23 Q But why at that spot?

24 A That's where we could achieve a couple of
25 things. We could achieve people permitting us to

05:24PM

TULSA FREELANCE REPORTERS
918-587-2878

1 sample. We had shallow wells, and we had them
2 giving us permission to look, fairly close together.
3 Those would be the reasons as I would reconstruct
4 them. If you are looking for some sinister reason,
5 it doesn't exist. 05:25PM

6 Q Have you interviewed well drillers, any well
7 drillers in northeast Oklahoma in this case?

8 A I have not.

9 Q Has anyone on your team interviewed well
10 drillers? 05:25PM

11 A No.

12 Q Do you know that people who drill domestic
13 water wells are required to submit to the State
14 Department of Health the first sample taken from the
15 well for bacteria? 05:25PM

16 A I'm aware that a sample needs to be submitted
17 for bacteria, but that first sample from the well
18 may or may not reflect stabilized conditions in the
19 well bore.

20 Q Why wouldn't that be useful information for
21 you to know? 05:25PM

22 A Well, I don't know if it would be useful or
23 not. The issue is that it could be really hit or
24 miss. You could have plenty of false positives and
25 plenty of false negatives with such information. 05:25PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q If the land application of chicken litter is
2 the source of the bacteria that's found in the eight
3 or nine wells that you put X's on and if it's true
4 that land application of chicken litter is pervasive
5 throughout the IRW, why aren't all the wells 05:26PM
6 contaminated with bacteria?

7 A Well, for the reasons I've put forward before.
8 We're dealing with a Karst terrain. Some of these
9 wells may be completed within fracture zones or
10 lineaments. Some of them may be completed within 05:26PM
11 matrix. There's going to be variable ability to
12 transport those materials, those components into
13 groundwater.

14 Q Were the sampling results for 2005 and 2007
15 approximately the same results, any dramatic 05:26PM
16 differences?

17 A No. We still find widespread presence of
18 bacteria.

19 Q Why do you call these results widespread?

20 A Because I find bacterially contaminated wells 05:27PM
21 over the entire width and breadth of the Oklahoma
22 portion of the watershed. I find them in the south;
23 I find them in the north; I find them in the middle,
24 and I find them in the west, and I find them in the
25 east, so it's all over the watershed. The fact that 05:27PM

TULSA FREELANCE REPORTERS
918-587-2878

1 there are nine samples with fecal contamination out
2 of, I don't know, 40 some samples displayed here is
3 kind of significant. I mean that's 20 percent.
4 Would you like to have a 20 percent risk of getting
5 sick? 05:27PM

6 Q Well, let me put it to you this way: I've
7 been drinking that water straight out of the ground
8 for a long time, Doctor, and I've never gotten
9 diarrhea.

10 MR. BULLOCK: You haven't? 05:27PM

11 Q And I suspect that that's the case since
12 statehood, that people have been drinking
13 groundwater in the Illinois River valley and not
14 getting sick from it, and you can't produce one warm
15 body of anybody who said they've been sick from it. 05:27PM
16 That's the conundrum, and that's my question to you.

17 MR. PAGE: Was there a question, but I'll
18 object to the form if there was a question.

19 MR. ELROD: If I were you, I would object
20 to the form also. 05:28PM

21 A And that question was asked and answered.

22 MR. McDANIEL: It's an improper conundrum.

23 Q But that's the conundrum in my mind. I mean
24 I've asked the same question regarding surface
25 water. I mean where are the sick people? 05:28PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: Object to the form.

2 Q And you can't tell me of finding one sick
3 person, can you?

4 A I've not done that study.

5 Q Okay. 05:28PM

6 MR. TUCKER: If the conundrum fits --

7 Q Seriously, I don't want a five-minute
8 explanation because I ain't got five minutes, but
9 can you just tell me how you correlate?

10 A Sure.

11 Q Can you tell me that quickly?

12 A Well, I can tell you how we correlate.

13 Q Yeah, please.

14 A Okay. Especially in lakes, such as Lake
15 Tenkiller, where we have about a half meter or so of 05:28PM
16 fine grained, non-cohesive sediments, which we might
17 call mud, the best way to achieve an undisturbed
18 core is a diver goes down with coring tubes, with
19 plastic tubes, which are inserted carefully into the
20 mud until you reach refusal. 05:29PM

21 Q How does the diver do that; how does a diver
22 at the bottom of Lake Tenkiller insert a plastic
23 tube into the muck?

24 A It's very easy to do. I've done it numerous
25 times, not in Lake Tenkiller. You go in heavy; 05:29PM

TULSA FREELANCE REPORTERS
918-587-2878

1 you're going to be negatively buoyant. You have
2 with you a basket as it were or holder for the core
3 tubes so you aren't fighting them. They're sitting
4 next to you. When you land on the bottom, you're
5 very careful not to disturb the area in front of 05:29PM
6 you, so you maintain an area of sediment that you're
7 not going to disturb with your fins. You don't work
8 behind yourself; always in front. Take the cores
9 from the coring basket and insert them, insert them
10 all at once into various portions of the sediment, 05:30PM
11 and then a top cap is placed upon the core tube.
12 The diver then digs down beside the core tubes since
13 it's relatively thin sediment and places a bottom
14 cap on the tube and extracts that from the mud,
15 places it in the hauling basket in an upright 05:30PM
16 position, and after all the cores are placed in this
17 particular hauling basket, the diver returns to the
18 surface. The hauling basket is then brought to the
19 surface by hand, and the cores are examined to be
20 sure they aren't disturbed. You don't want to see 05:30PM
21 -- if there's any muddy water over the top of the
22 core, that means you have a lot of disturbance at
23 the top.

24 Q Okay.

25 A You then band the cores so that -- 05:30PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q How do you do that?

2 A You band them with a hose clamp around the top
3 and bottom cap so they won't come off.

4 Q Okay.

5 A Then photograph the core and measure it in 05:30PM
6 some instance, some lakes. This is not one of them
7 but in some --

8 Q How do you pull the stuff out from inside of
9 the core?

10 A Ahh. When the core is suctioned, it's done by 05:31PM
11 a process called extrusion. There is a piston. An
12 O-ring sealed piston is inserted into the base of
13 the core. On a particular rig that was used here
14 there's a long lead screw.

15 Q Okay. 05:31PM

16 A That piston then is advanced until the
17 sediment, which will come up in mass and
18 undisturbed --

19 Q Like a grease gun?

20 A Like a grease gun, goes into a slicer like a 05:31PM
21 baloney slicer as it were. The piston is then
22 advanced using shims so one can do it in one, two,
23 three centimeters in a specified depth interval
24 consistently into the slicer where it's sliced and
25 placed into the sample bottle. 05:31PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q How do you know when you are getting one year,
2 when you are getting one year out the end of the
3 tube?

4 A Well, you aren't because you don't take one
5 year. You take, say, a centimeter or two
6 centimeters. You take depth intervals, which you
7 can measure as depth intervals.

05:32PM

8 Q All right. So then those one to two
9 centimeters that you decided to extract out of the
10 end of the tube will -- because it's mud will all
11 just intermix, fall apart?

05:32PM

12 A No.

13 Q How does that maintain its tube integrity if
14 it's mud? I can understand ice in a cold room and I
15 can understand a tree, but I don't understand mud.

05:32PM

16 A Okay. Well, I do. Mud at 90 percent water
17 content by weight is quite cohesive.

18 Q It's quite what?

19 A Quite cohesive. It hangs together. Mud at 70
20 percent water content you would find quite stiff and
21 be able to stand on. It would squish up between
22 your toes but you could stand on it quite easily.
23 The mud itself behaves in many ways like a grease.
24 I think that was a good analogy. It would be fluid
25 over time, but there's a rheology to this. There's

05:32PM

05:32PM

TULSA FREELANCE REPORTERS
918-587-2878

1 a flow property to this. Given the time of
2 extrusion, when it extrudes up, it will come up as a
3 cohesive whole and is sliced off and placed in the
4 sample bottle.

5 Q Who made the decision that you would not test 05:33PM
6 for Campylobacteria?

7 MR. PAGE: Object to the form.

8 A Not test for Campylobacteria in what?

9 Q I understood your testimony was that in these
10 well samples, as displayed on Exhibit 7, that you 05:33PM
11 tested for Salmonella and you gave us one Salmonella
12 test result out of 43, but I thought your testimony
13 was that you did not test for Campylobacteria?

14 MR. PAGE: Object to the form.

15 A My testimony was that the Campylobacter 05:33PM
16 analysis did not appear in that record.

17 Q Is there a Campylobacter analysis somewhere?

18 A For that well, no.

19 Q For all the wells, for any well?

20 A I don't believe there is. 05:33PM

21 Q Did you all test for Campylo?

22 A In the wells, I don't believe we did.

23 Q Who made the decision that you would not?

24 A I can't recall, but I know I did not make that
25 decision. I'm pretty sure that that decision was 05:34PM

TULSA FREELANCE REPORTERS
918-587-2878

1 made based upon other environmental sampling that we
2 had not finding Campylobacter in the environmental
3 samples.

4 Q So you weren't finding it, so you just quit
5 looking for it; is that true? 05:34PM

6 A That would be true. If it's not present
7 consistently in the source, then one would not
8 anticipate finding it in an environmental media
9 where the sources become dispersed.

10 Q And does Campylobacter come out the rear end 05:34PM
11 of a chicken?

12 A Well, I've actually had a run-in with
13 Campylobacter some years ago, and I understand that
14 it is a contaminant, one of the contaminants of
15 chickens. 05:34PM

16 Q And you all did not find it in the groundwater
17 and so you quit looking for it; is that true?

18 MR. PAGE: Object to the form.

19 A Okay. I don't know how to answer that
20 question from -- my testimony was, it's my 05:34PM
21 understanding that the number of detections of
22 Campylobacter were low and as a consequence, it was
23 not looked for further because it was not present.
24 If it's not present in the source, you won't find it
25 in environmental media. It's pretty much a basic 05:35PM

TULSA FREELANCE REPORTERS
918-587-2878

1 rule.

2 Q Out of that 1,771 wells, how many of them are
3 dug wells?

4 A Okay. Out of the 1,700 -- it actually turns
5 out to be 17 wells. I testified incorrectly with my 05:35PM
6 numeric dyslexia. It's 1,717. Of those wells, from
7 my review of the records, I do not believe any of
8 them to be dug wells since dug wells would be
9 historic wells. These wells are all wells that were
10 reported or known to the Oklahoma Water Resources 05:35PM
11 Board. There may be the odd dug well in there, but
12 it's not called out in those records.

13 Q What area of the lake did Core No. 1 come
14 from?

15 A Core No. 1 position is outlined or given in 05:35PM
16 terms of latitude and longitude and also
17 diagrammatically in the production materials. It
18 came from the region of the lake near the dam.

19 Q Okay. So you sent a diver down to the bottom
20 near the dam? 05:36PM

21 A Yeah.

22 Q 200 feet?

23 A Well, it's about 130 feet as I recall water
24 depth, yeah. And that's well within the range of
25 operational scuba, and I think he was actually using 05:36PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Nitrox.

2 Q Who was that person?

3 A That was Tim Knight.

4 Q K-N-I-G-H-T?

5 A Yes. 05:36PM

6 MR. ELROD: Go, John Boy.

7 DIRECT EXAMINATION

8 BY MR. TUCKER:

9 Q Where do you drink spring water?

10 A Where do I drink spring water? 05:37PM

11 Q Yes.

12 A Well, I personally drink spring water from
13 bottles so labeled.

14 Q Are there any springs from which you drink?

15 A No. 05:37PM

16 Q I want to show you maps that you have as a
17 part of your presentation. This is identified --
18 these don't have any numbers on them but they appear
19 in your DVD, CD's, whatever they are. This one is
20 called high density subwatershed. What does that
21 show? 05:37PM

22 A I don't believe these are from my production.

23 Q They are.

24 A Well, I've reviewed the records in my
25 production, and I don't recall seeing that record. 05:37PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Have you not seen that map before?

2 A It's not in my production to my knowledge, and
3 if you can show me one with the Bates number from my
4 production, then I'll say, yeah, it's in my
5 production, but this is not. 05:38PM

6 Q None of these have Bates numbers, but they
7 were pulled out of -- pulled by our folks out of the
8 production that was sent to us reflecting the
9 records you had reviewed as part of your deposition
10 testimony -- in anticipation of your affidavit 05:38PM
11 rather.

12 A I'll accept your representation.

13 Q Are you familiar with that; have you seen
14 that?

15 A Yeah, I've seen that. I'm just surprised it 05:38PM
16 shows up in my production. I don't think it was in
17 my production.

18 Q Did you prepare that or was that prepared at
19 your direction or have you reviewed it as part of
20 your affidavit work? 05:38PM

21 A I'll tell you what it is.

22 Q All right.

23 A It's a map just showing various subwatersheds
24 within the Illinois River watershed. It's not
25 really part of my affidavit. 05:38PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Do you know who did generate that?

2 A Looking at this, this could have been
3 generated either in our shop or in CDM's shop.

4 Q And that shows what?

5 A It's showing subwatersheds within the Illinois 05:39PM
6 River watershed.

7 Q What is meant by high density subwatershed?
8 That's how this document is titled. What does that
9 mean?

10 A I think it's really mislabeled because -- 05:39PM
11 anyway, I think that's mislabeled. These are
12 subwatersheds.

13 Q It has nothing to do with high density?

14 A The suite of watersheds that are labeled here,
15 looking at this whole sweep of them, are not high 05:39PM
16 density.

17 Q So the legend is incorrect?

18 A I believe it to be.

19 Q All right. I want to hand you a different
20 high density subwatershed, which also says now high 05:40PM
21 density subwatershed and land use. The last one
22 will be 14 and that which you are looking at will be
23 15.

24 A I see a series of subwatersheds within the
25 Illinois River watershed, and what's plotted on here 05:40PM

TULSA FREELANCE REPORTERS
918-587-2878

1 is land use as to whether it's pasture or woodland
2 or various kinds of pasture.

3 Q Are these the same watersheds that are shown
4 in Exhibit 14?

5 A They are. Let me see. Pasture -- I'd be 05:40PM
6 speculating if I told you why these were generated.

7 Q You have no use for those in your opinion?

8 A No.

9 Q Can you tell me why there is an additional
10 site shown here first on the far east end of the 05:41PM
11 watershed and then a little spot on the northwest
12 end of the watershed; can you tell me why those
13 are added?

14 A I can tell you what they are. These are --
15 it's plotting land use as the underpinning, and 05:41PM
16 those are urban land use areas.

17 Q And the one to the northwest is so small it
18 looks like a dot on a pencil almost?

19 A Well, these are land areas classified as urban
20 land use. 05:41PM

21 Q The one on the northwest would be considered
22 urban land use, this little spot here that's
23 the size of --

24 A No, no, no, no, no.

25 Q Why is that? 05:42PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A I'm sorry. Mr. Tucker, I think there's an
2 unfortunate choice of color on this representation.

3 Q Are you out of tape? I'm sorry, we're out of
4 tape.

5 A Oh, we are? 05:42PM

6 VIDEOGRAPHER: We're now off the Record.
7 The time is 5:42 p.m.

8 (Whereupon, a discussion was held off
9 the Record.)

10 VIDEOGRAPHER: We are back on the Record. 05:42PM
11 The time is 5:43 p.m.

12 Q Please look -- the answer about 15 is you
13 really don't know why that was done that way; is
14 that correct?

15 A No. Let's get back to the question that was 05:43PM
16 on the table.

17 Q I want to know why the little dot is in the
18 northwest corner there. What is that supposed to
19 be; why is that added?

20 A I don't know why it was added, but what it 05:43PM
21 represents are from an area that was sampled, and
22 these are multiple pastures that belong to Mr.
23 Schwabe.

24 Q Please look at No. 16 and No. 17. You talked
25 earlier about faulting in this Karst, Karsted area? 05:43PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Yes.

2 Q 16 and 17 reflect the faults that are the
3 major faults in that area; is that the purpose of 16
4 and 17?

5 A Yes. These are reflective of the truly large 05:43PM
6 faults. If you read the scientific literature,
7 you'll see this place is broken like a cup and --

8 Q Now, you told us --

9 A I'm not done with my answer.

10 Q I got your answer. 05:43PM

11 A No. The answer is, these represent the major
12 areas of faulting that are mapped on regional scaled
13 geologic maps. These are big features. If you take
14 a look at the rectolinear patterns of streams here
15 and look at the data on mapping lineaments and then 05:44PM
16 proving them as asphalts that have been published in
17 northwest Arkansas, you'll note that it's much, much
18 more fractured than that. These are major features.

19 Q I understand, and you also told us that you
20 had not done a study on a field-by-field basis 05:44PM
21 looking for minor faults or voids or so forth. You
22 said that earlier in your answers to Mr. George.

23 The only map I found that was in any of your
24 materials that had to do with depiction of any
25 faults are Exhibit 16 and 17. Are there others -- 05:44PM

TULSA FREELANCE REPORTERS
918-587-2878

1 other documents you prepared that reflect faults on
2 a smaller, on a more exploded geographic scale, or
3 are 16 and 17 it?

4 A There are documents in the published
5 literature that describe lineaments and fractures
6 and faulting here. I did not prepare them. They
7 were prepared by others. They were prepared and
8 published in literature.

05:44PM

9 Q I saw none of those in any of the materials
10 you considered as furnished to us. Is that correct
11 or was your material incomplete?

05:45PM

12 MR. PAGE: Object to the form.

13 A I don't know what was furnished to you. If
14 you were furnished with the complete production that
15 I had, that material would be in there.

05:45PM

16 Q And it would show a closer scale of faults; is
17 that right?

18 A It would.

19 Q All right. You answered a question with
20 respect to other companies and the litter that their
21 growers have and how that litter is used. Do you
22 have any evidence that a Cargill grower's litter has
23 caused any fecal contamination in the Illinois River
24 watershed?

05:45PM

25 MR. PAGE: Object to the form.

05:46PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A We have evidence that litter from Cargill
2 growers has been disposed within the Illinois River
3 watershed.

4 Q But answering my specific question, do you
5 have any evidence that a Cargill grower's litter 05:46PM
6 caused any fecal contamination in the Illinois River
7 watershed?

8 MR. PAGE: Same objection.

9 A I've not looked specifically. We may.

10 Q The answer is, you don't know of any? 05:46PM

11 A The answer is, as I sit here today, I can't
12 recall any, but there may be an instance in which
13 there is data, such as just as there was with
14 Peterson, showing microbial contamination of surface
15 waters within the watershed. 05:46PM

16 Q If the question were to you today, do you know
17 of any as you sit here today, as I understand it,
18 your answer is, I do not at this time know of any
19 here today?

20 A Except as they may be shown or revealed within 05:46PM
21 the production documents that I gave you.

22 Q I understand. You told us about your sampling
23 procedures. You gave us the distances of 41, 50, 36
24 and 48 centimeters. You always used the term to the
25 bottom. Does that mean you went to the base where 05:47PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the sedimentation began when the dam was closed?

2 A Okay. The cores are inserted to refusal. So
3 that would be the idea, would be to be able to get
4 and recover, if at all possible, some part of the
5 original surface. 05:47PM

6 Q Why did you not use -- did I understand that
7 you did use 3 and 4, Core 3 and 4, but that those
8 for some reason were omitted from your production
9 and they will now be produced?

10 A No. 05:47PM

11 Q Why did you not use 3 and 4 then?

12 A Cores 3 and 4 were used, and they are in my
13 production. All the data from the cores is in the
14 production.

15 Q Why did you not do the correlations that you 05:47PM
16 did with 1 and 2 for 3 and 4?

17 MR. PAGE: Object to the form.

18 A Well, I'm not sure anything we looked at today
19 didn't involve only the Core 1. So I'm not sure we
20 looked at any correlations with Core 2 frankly, but 05:47PM
21 3 and 4 were looked at in that sense, and everything
22 seems together. It all works together.

23 Q Did you present the same correlation analysis
24 for 3 and 4 that you did for 1?

25 A You mean present it in a presentation? 05:48PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Yes.

2 A No.

3 Q Why not?

4 A Because it becomes repetitive in a

5 presentation format to show them.

05:48PM

6 Q Could you have?

7 A Pardon?

8 Q Could you have?

9 A Yes.

10 Q And you would have gotten the same answer in

05:48PM

11 your judgment?

12 A Yes.

13 Q Why did you base your analysis on dry weight

14 as opposed to wet weight for phosphorus?

15 A In the sediment?

05:48PM

16 Q Yes.

17 A Because the water content varies within the

18 sediment. So if one is looking at flux of

19 phosphorus, which would be load, load to the

20 sediments, it needs to be placed on a consistent

05:48PM

21 basis.

22 Q Could you have used wet instead of dry?

23 A Yes, and it would have made -- it would not

24 have made as much sense.

25 Q But could you have used wet instead of dry?

05:49PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A Of course.

2 Q Could you have used wet and dry and then
3 compared the two to see if there were differences?

4 A It would be a meaningless comparison.

5 Q Could you have done it? 05:49PM

6 A Yes.

7 Q Did I understand your answer previously to be
8 that your analysis does not take specifically into
9 account the implementation of nutrient management
10 plans in the watershed? 05:49PM

11 MR. PAGE: Object to the form.

12 A I don't understand your question.

13 Q Well, let me ask it directly then. Does your
14 analysis take into account implementation of
15 nutrient management plans in the watershed? 05:49PM

16 A Which analysis?

17 Q Any of your analysis, any of the presentations
18 you've made?

19 A Well, it does. I mean my analysis looks at
20 the application of poultry waste. To the extent 05:49PM
21 that it's contemplated on site within the watershed
22 by nutrient management plans, my analysis takes them
23 into account.

24 Q Do you know whether nutrient management plans
25 have increased or reduced or had no effect at all on 05:50PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the amount of, for example, phosphorus entering the
2 watershed?

3 A Well, I mean phosphorus and new source
4 phosphorus, newly applied litter or waste?

5 Q That which gets in the water that can get to 05:50PM
6 the lake?

7 MR. PAGE: Object to the form.

8 A Okay. My suspicion is that because of the
9 state of phosphorus content of soils within this
10 watershed, something that Dr. Gordon Johnson will 05:50PM
11 discuss, that I've looked at that information with
12 him in the past. There's so much phosphorus here
13 that aside from the transitory, the current
14 transitory large fluxes into surface waters from
15 during -- when that litter is applied or waste is 05:51PM
16 applied, that there is a large base load from
17 leaching from the soils within the watershed.

18 Q You're talking about from previous
19 applications?

20 A Yes, of phosphorus. 05:51PM

21 Q Do you have any estimate as to the fraction of
22 poultry litter that applied to the field -- that is
23 applied to fields that runs off, as you've used the
24 phrase?

25 A No. 05:51PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Have you made acoustic studies of any lake
2 other than Tenkiller?

3 A I've -- not of any lake. I've made acoustic
4 studies of marine bodies of water. Oh, no, that's
5 not true. I've done acoustic work in Lake Erie. 05:51PM

6 Q Lake Erie?

7 A Uh-huh.

8 Q And when was that done?

9 A 1970's.

10 Q Would you agree that assuming that a water 05:51PM
11 sampling protocol is followed, that a scientist
12 would place some faith in the results of that
13 sampling for giving opinions?

14 A Yes.

15 Q Would you agree that if a water sampling 05:52PM
16 protocol is not followed, then the results of that
17 sampling would not be considered valid and reliable?

18 A No. You would have to take a look at the
19 variations that existed from the protocol, whether
20 they be, as Mr. McDaniel represented, simply 05:52PM
21 technical, or whether they were material.

22 Q Which Cargill grower locations have you
23 personally looked at?

24 A Gosh, I'd have to review my notes on that. I
25 don't know. 05:52PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Do you know whether you've ever looked at any?

2 A Well, if you would count aerial photographs,
3 I've looked at all of them.

4 Q I'm actually thinking about being a little
5 closer to it than from the air. 05:53PM

6 A I know I've looked at facilities with Cargill
7 signs.

8 Q Do you know which ones?

9 A I do not.

10 Q Do you know how many? 05:53PM

11 A I do not, not as we sit here today.

12 Q Do you know where?

13 A Where they're located in the watershed, I mean
14 what I base that upon, I've looked at all of them in
15 the air photos. I have been in most places in this 05:53PM
16 watershed. I have looked at thousands of these
17 structures. Some of them had Cargill signs in front
18 of them.

19 Q You referred in your affidavit that the soils
20 in the watershed are of low natural fertility. 05:53PM
21 Without added nutrients, what is the fate of the hay
22 yields in the Illinois River watershed?

23 A Without nitrogen being added, the hay yields
24 would decrease.

25 Q Do you have any idea how many tons per acre 05:53PM

TULSA FREELANCE REPORTERS
918-587-2878

1 are produced by soils, how many tons of hay per acre
2 are produced in the Illinois River watershed now?

3 A That would be beyond my expertise and within
4 that of other experts in this matter.

5 Q Do you have any concept as to the value of the 05:54PM
6 hay that's produced in the watershed at the present
7 time?

8 A I do not. That would be other experts in this
9 case.

10 Q Who would that be? 05:54PM

11 A I believe Dr. Gordon Johnson might be able to
12 testify to that.

13 Q When poultry litter from a grower is sold, who
14 sets the price of that?

15 A One would hope the market. I don't know who 05:54PM
16 sets the price for poultry litter.

17 Q Who gets the money?

18 A Who gets the money? I -- the owner of the
19 litter. The person who gets the money is the owner
20 of the litter. 05:54PM

21 Q Do you know who gets the money now in the
22 watershed?

23 A I do not.

24 Q On Page 7 of your affidavit you state that the
25 geology and terrain of the Illinois River watershed 05:55PM

TULSA FREELANCE REPORTERS
918-587-2878

1 allows the constituents of land applied poultry
2 waste, including bacteria, to readily travel from
3 the fields receiving poultry waste into surface and
4 ground water. You state this has been verified by
5 scientific literature and analysis of environmental
6 media. Would you identify for me which Cargill
7 grower field or field on which Cargill growers'
8 litter has been applied you are referring to in that
9 affidavit at that point?

05:55PM

10 A As I stated to Mr. McDaniel, placing poultry
11 waste on any surface within the Illinois River
12 watershed will inevitably lead to some fraction of
13 that waste entering the surface and groundwater of
14 the Illinois River watershed. That is an
15 unequivocal answer. So if Cargill placed waste
16 within the Illinois River watershed, components of
17 that waste have reached both surface water and
18 groundwater.

05:55PM

05:56PM

19 Q Why did you do edge of field tests?

20 A That is part of a pathway analysis.

05:56PM

21 Q What edge of field test from a Cargill
22 grower's field or field in which Cargill growers'
23 litter was applied demonstrated any fecal
24 contamination?

25 A Okay. You asked that question earlier, and to

05:56PM

TULSA FREELANCE REPORTERS
918-587-2878

1 the extent that I have that data, it is in the
2 documents that I have produced and reviewed.

3 Q Actually that's a little bit different. It's
4 the same in a different way but same answer. You
5 don't know of any right now as you sit here?

05:56PM

6 A I'm sure if there -- if one exists, it's in
7 the documents I've had. I've not reviewed them for
8 specific, all specific linkages to edge of field
9 samples to specific integrators.

10 Q Is it your intention when you testify as an
11 expert to testify that data, specific data that
12 demonstrates that fecal contamination is occurring
13 is measured by identifying fecal contamination from
14 litter applied to fields by each of the defendants
15 named in this lawsuit, or do you only have Peterson
16 as a sample?

05:57PM

05:57PM

17 MR. PAGE: Object to the form.

18 A I believe there are more examples than that.
19 I don't know exactly all the examples. I would
20 testify that when waste is applied to a field, it
21 runs off. Some of it infiltrates. I will testify
22 that from the edge of field samples, we show that
23 whenever waste is applied to a field and there is
24 runoff from that field, that runoff contains
25 bacteria.

05:57PM

05:57PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q And as I understand what you're saying, as to
2 some growers, as to some sites, you can prove it and
3 as to others, you just have to say that's the rule;
4 is that correct?

5 A I say that that is the nature of water running 05:58PM
6 downhill. That's the nature of gravity. If waste
7 is placed on a field, components of that waste will
8 inevitably run off that field and infiltrate.

9 Q Let me ask my question better. Some of your
10 edge of field studies show fecal material in the 05:58PM
11 runoff; is that right?

12 A That's correct.

13 Q Others do not; is that right?

14 A That's correct.

15 Q And as to those areas where your tests do not 05:58PM
16 show any fecal material in the runoff, you
17 nonetheless continue to hold the opinion that it
18 just hasn't run off yet; is that correct?

19 A I think that would be an appropriate opinion,
20 yes. 05:58PM

21 Q Okay.

22 MR. TUCKER: Thank you, sir. That's what I
23 have.

24 DIRECT EXAMINATION

25 BY MR. SANDERS:

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Dr. Fisher, my name is Bob Sanders. I
2 represent the Cal-Maine defendants, and this will be
3 very brief. When you looked at your core samples,
4 could you differentiate between POTW phosphorus and
5 non-point source phosphorus? 05:59PM

6 A Phosphorus is phosphorus. However, there is a
7 correlation with other materials, which I believe
8 Dr. Olsen will discuss.

9 Q Okay, but for phosphorus, you couldn't tell
10 any difference? 05:59PM

11 A Phosphorus is phosphorus, but the amounts from
12 poultry are far higher than --

13 Q That's not what I asked you but --

14 A Phosphorus is phosphorus.

15 Q Okay. Thank you. Now, I guess your affidavit 05:59PM
16 is Exhibit 1. I want to ask you just a couple of
17 questions about the affidavit. Do you have that
18 handy?

19 A I do.

20 Q On Paragraph 5 on Page 4, you talk about 05:59PM
21 various things that led you to the conclusion that
22 all of these named defendants have land applied
23 significant amounts of poultry waste in the IRW; is
24 that correct?

25 A That is correct. 06:00PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q When were those reports by the investigators
2 made?

3 A When were they made?

4 Q Yes.

5 A Investigator reports with respect to waste 06:00PM
6 application generally would have been from 2005 but
7 late in 2005, 2006 throughout the year and 2007.

8 Q Okay, and the same question for your directed
9 observations, when were those direct observations
10 made? 06:00PM

11 A Okay. Those direct observations would have
12 been made by me from that -- in the same general
13 period, so those were the times I would be in the
14 field.

15 Q All right. Present as we sit here now, do you 06:00PM
16 anticipate that there will be any changes in either
17 the facts or the opinions that you have expressed in
18 your affidavit when you get to the preliminary
19 injunction hearing?

20 MR. PAGE: Object to the form. 06:01PM

21 A I believe that these will be largely as
22 they're expressed in here. I don't foresee any
23 changes to them at this time unless there's other
24 information that comes to light between now and
25 trial. 06:01PM

TULSA FREELANCE REPORTERS
918-587-2878

1 Q Okay. Do you presently have any assignments
2 or tasks given to you by any of the attorneys for
3 the State of Oklahoma on things that they want you
4 to do between now and the time of the preliminary
5 injunction hearing? 06:01PM

6 A Yes.

7 Q Can you tell me what you'll be working on
8 between now and the time of the hearing?

9 A Demonstrative aids and exhibits, continue to
10 review the waste generation information that I have, 06:02PM
11 refine that, be sure that that's in good shape.

12 Q Are you talking about new additional waste
13 generation information or the waste generation
14 information that you already have?

15 A Well, it would be information that's currently 06:02PM
16 present in discovery, some of which I may not have
17 had a chance to look at, so, for example, the very
18 recently produced bird count numbers.

19 Q Okay, and I may have cut you off. You were
20 telling me things that you were going to be looking 06:02PM
21 at between now and the preliminary injunction
22 hearing.

23 A I think I covered the waterfront. It's going
24 to be looking at waste. I'll review groundwater
25 data and conditions pertaining to sample collection 06:02PM

TULSA FREELANCE REPORTERS
918-587-2878

1 and those things in more detail.

2 Q All right. With regard to demonstrative
3 exhibits, have you already prepared some
4 demonstrative exhibits?

5 A No. 06:02PM

6 Q Are you in the process now of preparing any
7 demonstrative exhibits?

8 A I'll begin that ten minutes after we're done
9 today.

10 Q Okay. Have you seen any demonstrative 06:03PM
11 exhibits that will be presented by any of the other
12 experts in this case?

13 A No.

14 MR. SANDERS: That's all I have. Thank
15 you. 06:03PM

16 MR. PAGE: I have a couple of questions.

17 CROSS EXAMINATION

18 BY MR. PAGE:

19 Q Dr. Fisher, I think Mr. George and maybe also
20 Mr. McDaniel showed you Exhibits 5, 6 and 7 06:03PM
21 concerning some well and spring data that you
22 reviewed.

23 A Yes, yes.

24 Q Is that the totality of the groundwater spring
25 data that you reviewed and relied upon that's 06:03PM

TULSA FREELANCE REPORTERS
918-587-2878

1 represented in those three exhibits --

2 A No.

3 Q -- in your opinions?

4 A No. As I testified subsequent to that, that

5 the 2007 and 2005 groundwater and spring 06:03PM

6 information, which is included by specific Bates

7 number reference in my production materials, is also

8 considered.

9 Q And when you say groundwater information, does

10 that also include geoprobe information? 06:04PM

11 A Yes.

12 Q Was any geoprobe information provided you

13 today in your deposition?

14 A No. There were no specific analysis from

15 geoprobe in my production, but there was -- there's 06:04PM

16 a table that relates to specific Bates number

17 references that contain some geoprobe information,

18 and that would be what I would rely upon.

19 Q Okay, and are you continuing to evaluate the

20 materials in this case in preparation for your 06:04PM

21 opinions in the preliminary injunction hearing?

22 A Yes, I am. As I just testified to the last

23 gentleman, we'll review all this information that's

24 before me in preparation for testimony and give

25 accurate and complete testimony. 06:04PM

TULSA FREELANCE REPORTERS
918-587-2878

1 MR. PAGE: That's all I have.

2 MR. ELROD: David, for the Record, I say
3 the same thing to you we said earlier and, that is,
4 that we're going to throw a hissy fit if his
5 opinions change one iota from the ones he gave today 06:05PM
6 and if he produces further information that he's
7 relying on in giving his opinion at the PI hearing.

8 MR. PAGE: Well, all I can say, John, is I
9 suspect you'll throw a hissy fit regardless of what
10 happens, but I understand what you're saying. 06:05PM

11 MR. GEORGE: I have one follow-up.

12 REDIRECT EXAMINATION

13 BY MR. GEORGE:

14 Q Dr. Fisher, how many additional groundwater
15 samples beyond those that are in front of you today 06:05PM
16 are you recalling that you may ultimately base your
17 opinion on at the preliminary injunction hearing?

18 A I don't really know at this time. There are
19 probably something like an equivalent number.

20 Q Another 40 or -- 06:05PM

21 A Something like that.

22 Q 40 groundwater samples?

23 A Yeah.

24 Q And spring water samples I think were about 25
25 is what I counted. 06:05PM

TULSA FREELANCE REPORTERS
918-587-2878

1 A At most. I think that's correct.

2 Q Just so the Record is clear, Dr. Fisher, you
3 are not intending to opine at the preliminary
4 injunction hearing based on any sample, the report
5 of which has not already been produced as of today 06:06PM
6 to the defendants; is that correct?

7 A That is correct.

8 Q And to the extent there are other areas of
9 sampling data that may be foundational to any
10 opinions you'll offer, they are identified by 06:06PM
11 specific Bates range in your referenced materials;
12 correct?

13 A That is correct.

14 MR. McDANIEL: I just have one question for
15 indulgence. 06:06PM

16 REDIRECT EXAMINATION

17 BY MR. McDANIEL:

18 Q Dr. Fisher, the topic I want to ask you about
19 is this analysis you did comparing the chemical data
20 in the cores to animal populations, human 06:06PM
21 population, et cetera.

22 MR. PAGE: This goes beyond the scope of my
23 cross examination.

24 MR. McDANIEL: I know it does. It's one
25 question, and you can tell him not to answer it or 06:06PM

TULSA FREELANCE REPORTERS
918-587-2878

1 whatever.

2 MR. PAGE: One question, I'll take you at
3 your word.

4 MR. McDANIEL: It honestly is.

5 MR. BULLOCK: If it's not a speech. 06:06PM

6 MR. GEORGE: You mean the answer or the
7 question?

8 MR. McDANIEL: Is everybody done now?

9 MR. PAGE: Ask your question, Scott.

10 Q Dr. Fisher, you stated that when you compared 06:07PM

11 the core chemical analysis, you found a better fit

12 to the poultry numbers than you did when you

13 compared it to cattle and when you compared it to

14 humans, and you may have said something else, but

15 you indicated some other things that you compared it 06:07PM

16 to. It's in the Record. Did you compare the core

17 chemical data to combinations of those other

18 factors; in other words, did you consider that the

19 changes in the core chemical data could be accounted

20 for by increases of cattle and humans? 06:07PM

21 A Yes.

22 Q Or cattle and something else?

23 A The answer to that is yes.

24 Q Where is that in your materials?

25 A The same place that Mr. George's other graphs 06:07PM

TULSA FREELANCE REPORTERS
918-587-2878

1 are, which is somewhere not in your production, but
2 all the data, all the data that you could use to
3 make those comparisons is in your possession in its
4 native state.

5 Q Have you graphed -- has that been graphically 06:08PM
6 represented?

7 A I have, but somehow the right stuff didn't get
8 to you.

9 MR. McDANIEL: Thank you. That's all.

10 MR. GEORGE: David, is that included in the 06:08PM
11 materials that you agreed to produce earlier?

12 MR. PAGE: Yeah. We believe those
13 materials were produced, and it may be difficult to
14 locate, but to eliminate the issue, we're going to
15 provide them to you. 06:08PM

16 MR. TUCKER: Let me mention while we're all
17 here, apparently a bunch more stuff --

18 MR. PAGE: Are we still on the Record,
19 John?

20 MR. TUCKER: Might as well be. I'll just 06:08PM
21 say it and everybody can have their time in. A
22 bunch more stuff was produced today for Dr. Olsen's
23 deposition, which is Friday, and the people that are
24 having to understand and digest that and be ready to
25 take that deposition are about to have strokes 06:08PM

TULSA FREELANCE REPORTERS
918-587-2878

1 because they were looking for 21 days and they're
2 getting like two days.

3 MR. GEORGE: Well, I'm one of those people,
4 and I was unaware of that, John, until you just now
5 said it. So to the extent I cannot absorb that
6 material in time to take Dr. Olsen's deposition on
7 Friday, we're going to have to reschedule it.

06:08PM

8 MR. BULLOCK: I'm not quite sure what
9 you're talking about, and I'll check into it. I
10 know that I did produce a significant amount of the
11 scientific data and the ongoing updating of that,
12 and it became available and so I provided it to you,
13 but if that's what you are referring to --

06:09PM

14 MR. GEORGE: I don't know. Ask John.

15 MR. TUCKER: I'm referring to whatever was
16 delivered in a DVD today sometime this afternoon.

06:09PM

17 MR. PAGE: Yeah, there was some additional
18 information.

19 MR. GEORGE: For Olsen?

20 MR. PAGE: For Dr. Olsen.

06:09PM

21 MR. TUCKER: All I know, it was way too big
22 to be sent over the Internet. It has to be
23 reproduced and mailed.

24 MR. GEORGE: How flexible is Olsen in terms
25 of his schedule because honestly I'm going to look

06:09PM

TULSA FREELANCE REPORTERS
918-587-2878

1 at it tonight for the first time, and I'm supposed
2 to take the lead on that deposition, and I've
3 already got a mountain of stuff to review.

4 MR. PAGE: Well, I know he's coming in to
5 town to prepare for his deposition. In fact, he's
6 already in town.

06:09PM

7 MR. GEORGE: Well, he may have to go back.

8 MR. BULLOCK: On the other hand, we'll
9 visit about this and talk tomorrow. I mean on the
10 other hand, we moved him up at your all's request,
11 but we'll take a look at it. We're not -- here at
12 the end of today, I don't think this would be a good
13 moment to make that decision, but we'll talk to you
14 in the morning, and maybe we can have a good
15 discussion.

06:10PM

06:10PM

16 VIDEOGRAPHER: This concludes the
17 deposition of Dr. Berton Fisher. We're now off the
18 Record. The time is 6:10 p.m.

19 (Whereupon, the deposition was
20 concluded at 6:10 p.m.)

06:10PM

21
22
23
24
25
TULSA FREELANCE REPORTERS
918-587-2878

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

SIGNATURE PAGE

I, Berton Fisher, PhD, do hereby certify
that the foregoing deposition was presented to me by
Lisa A. Steinmeyer as a true and correct transcript
of the proceedings in the above styled and numbered
cause, and I now sign the same as true and correct.

WITNESS my hand this _____ day of
_____, 2008.

BERTON FISHER, PhD

SUBSCRIBED AND SWORN TO before me this
_____ day of _____, 2008.

Notary Public

My Commission Expires:

TULSA FREELANCE REPORTERS
918-587-2878

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CORRECTIONS TO THE DEPOSITION OF
BERTON FISHER, PhD

PAGE AND LINE NUMBER

CORRECTION

TULSA FREELANCE REPORTERS
918-587-2878